

Annual Conference of the Phytochemical Society of North America 2023

Event Schedule

Sun, Jul 16, 2023

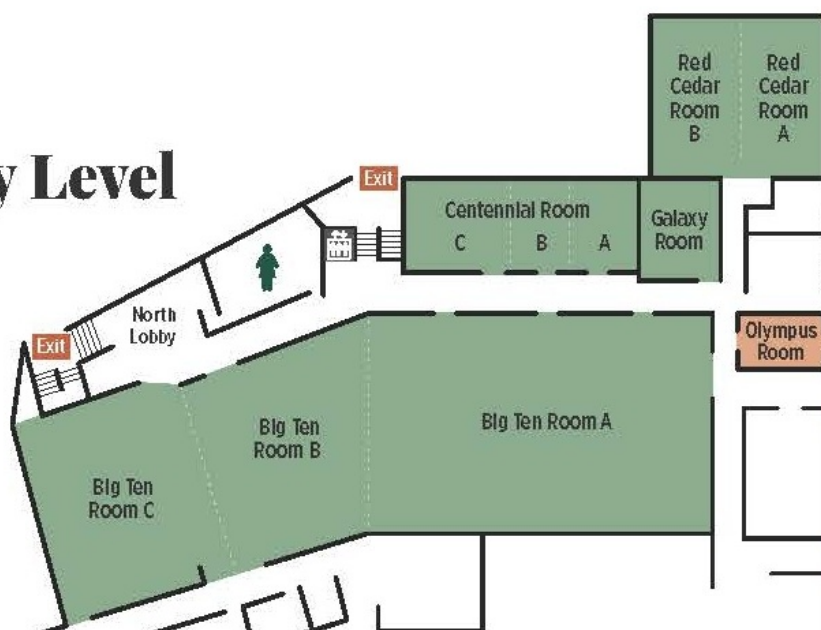
2:00 PM

Conference Registration

🕒 2:00 PM - 8:00 PM, Jul 16

📍 Big North Lobby

Lobby Level



Poster set-up

🕒 2:00 PM - 8:00 PM, Jul 16

📍 Big Ten B

5:15 PM

Opening Remarks

🕒 5:15 PM - 5:30 PM, Jul 16

📍 Big Ten A

🗣️ Speaker



Bjoern Hamberger

Conference organization. Faculty.
Michigan State University

5:30 PM

Plenary Talk - Sue Rhee | Genome-scale regulatory network governing growth and chemical defense in *Arabidopsis thaliana*

🕒 5:30 PM - 6:30 PM, Jul 16

📍 Big Ten A

Plant metabolism functions in an intricate network of reactions that underpin growth and chemical defense. How this connected system balances between growth and chemical defense at the systems level remains undetermined. Here, we investigated the relationship between growth and chemical defense by examining the transcriptional profiles of all the metabolic genes involved in these two processes. Correlation analysis revealed that growth- and chemical defense-associated metabolic genes showed both trade-off and cooperation relationships under various biotic stress conditions. We further investigated how the balance between growth and chemical defense is transcriptionally controlled by identifying transcription factors (TFs) directly regulating metabolic genes involved in these two processes. We identified 149 growth- and 75 chemical defense-associated TFs using our gene regulatory network inference method called MERIT, 57 of which were found in common. We functionally tested 36 TFs using a high throughput transient overexpression system in tobacco leaves and 29 of them altered growth- or chemical defense-associated metabolic genes as expected. We selected 13 previously uncharacterized TFs and isolated homozygous mutants to characterize their function on balancing growth and chemical defense. We assayed the growth of these mutants by measuring the change of primary root length and fresh weight of *Arabidopsis* seedlings under flg22 treatment. We found three categories of phenotypes: increasing (2), decreasing (6), and unchanged (5) relative to mock treated plants. To quantify the chemical defense response, we profiled the metabolome using untargeted metabolomics in wild type plants and identified 189 metabolic features responding to flg22 treatment. We are in the process of measuring the metabolome of 13 novel TF mutants. This study reveals novel insights on the balance between growth and defense, some of which could lead to novel engineering strategies to enhance the resilience of crops.

🔊 Speaker



Sue Rhee
 Foundation Professor
 Michigan State University

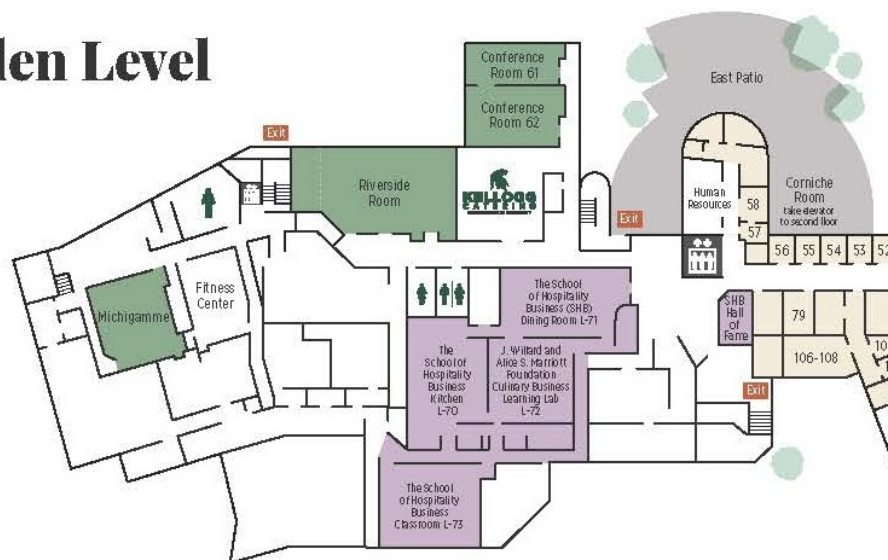
6:30 PM

Welcome Reception

🕒 6:30 PM - 8:00 PM, Jul 16

📍 Kellogg - East Patio

Garden Level



Mon, Jul 17, 2023

7:30 AM

Conference Registration

🕒 7:30 AM - 1:00 PM, Jul 17

📍 Big Ten Foyer

Breakfast

🕒 7:30 AM - 8:30 AM, Jul 17

📍 Big Ten B & C

8:30 AM

Symposium I: Gene Discovery and Functional Genomics

🕒 8:30 AM - 11:40 AM, Jul 17

📍 Big Ten A

👤 Chair



Argelia Lorence

James and Wanda Lee Vaughn Endowed Professor
Arkansas State University

13 Subsessions

● **Announcements**

🕒 8:30 AM - 8:35 AM, Jul 17

● **Keynote - Dae-Kyun Ro: New insights into natural rubber biosynthesis from rubber-deficient lettuce mutants expressing goldenrod or guayule cis-prenyltransferase**

🕒 8:35 AM - 9:05 AM, Jul 17

● **TPJ - PSNA Award Presentation - Lars Kruse: Production of the antidiabetic metabolite montbretin A in *Nicotiana benthamiana* – exploiting large enzyme family members for pathway engineering**

🕒 9:05 AM - 9:25 AM, Jul 17

● **Break (20min)**

🕒 9:25 AM - 9:45 AM, Jul 17

● **Biosynthesis of Kratom Opioids**

🕒 9:45 AM - 10:00 AM, Jul 17

● **Insights into alkaloid chemistry and molecular characterization of *Mitragyna speciosa*, a tree with a potential to treat pain and opioid withdrawal**

🕒 10:00 AM - 10:15 AM, Jul 17

● **Down and dirty: a novel pathway for the biosynthesis of acylsugars in tomato roots**

🕒 10:15 AM - 10:30 AM, Jul 17

● **The ups and downs of alkene accumulation in poplar trees**

🕒 10:30 AM - 10:45 AM, Jul 17

● **Characterization of Cytochrome P450 Monooxygenases and the Biosynthesis of Switchgrass Diterpenoids**

🕒 10:45 AM - 10:55 AM, Jul 17

● **Discovery of a cytochrome P450 enzyme catalyzing the formation of spirooxindole alkaloid scaffold**

🕒 10:55 AM - 11:05 AM, Jul 17

● **Convergence and constraint in glucosinolate evolution across the Brassicaceae**

🕒 11:05 AM - 11:15 AM, Jul 17

● **Specialized metabolites from tomato impact the *Trichopulsia ni* gut microbiome**

🕒 11:15 AM - 11:25 AM, Jul 17

● **Break (15min)**

🕒 11:25 AM - 11:40 AM, Jul 17

11:40 AM

Symposium II: New Technologies, Analytics and Pathway Discovery

🕒 11:40 AM - 1:00 PM, Jul 17

📍 Big Ten A

👤 Chair



Rock Du

Assistant Professor
University of Hawaii at Manoa

4 Subsessions

● **Keynote - Sankarganesh Krishnamoorthy: Chemical probes for protein function characterization**

🕒 11:40 AM - 12:10 PM, Jul 17

● **Arthur Neish Award Presentation - Peter Lundquist | Plastoglobule Lipid Droplets as a Platform for Metabolic Engineering**

🕒 12:10 PM - 12:30 PM, Jul 17

● **Novel Benzoquinone Proanthocyanidins: The Absolute Configuration and Biosynthetic Implications**

🕒 12:30 PM - 12:45 PM, Jul 17

● **Early Steps Toward Metabolite-Informed Breeding of Theobroma cacao**

🕒 12:45 PM - 1:00 PM, Jul 17

1:00 PM

Lunch

🕒 1:00 PM - 2:00 PM, Jul 17

📍 Big Ten C

2:00 PM

Symposium II: New Technologies, Analytics and Pathway Discovery

🕒 2:00 PM - 2:30 PM, Jul 17

📍 Big Ten A

👤 **Chair**



Rock Du

Assistant Professor
University of Hawaii at Manoa

2 Subsessions

● **6-Phosphogluconate dehydratase gene loss among prokaryotes drove the transition from the Entner-Doudoroff pathway to glycolysis in early plants**

🕒 2:00 PM - 2:10 PM, Jul 17

● **Revealing Molecular Architecture and Carbohydrate-Aromatic Interface of Plant Cell Walls by Solid-State NMR**

🕒 2:20 PM - 2:30 PM, Jul 17

2:20 PM

Symposium III: Metabolic engineering

🕒 2:20 PM - 5:15 PM, Jul 17

📍 Big Ten A

👤 **Chairs**



Mark Lange and Andrea Glassmire

9 Subsessions

● **Keynote - Argelia Lorence | Engineering Climate Resilient Crops with Elevated Ascorbate Content**

🕒 2:30 PM - 3:00 PM, Jul 17

● **Arthur Neish Award Presentation - Dr. Zhen Wang | Elucidate the Biosynthetic Pathway of Digoxin in Foxglove Plants**

🕒 3:00 PM - 3:20 PM, Jul 17

● **Targeted mutagenesis of cardiac glycoside biosynthetic genes in *Erysimum cheiranthoides***

🕒 3:20 PM - 3:35 PM, Jul 17

● **Break (20 min)**

🕒 3:35 PM - 3:55 PM, Jul 17

● **Smoothing out 'WRINKLES' in Plant Oil Biosynthesis**

🕒 3:55 PM - 4:10 PM, Jul 17

● **ABA-regulated JAZ1 Proteins Bind NAC42 Transcription Factors to Suppress the Activation of Phytoalexin Biosynthesis in Plants**

🕒 4:10 PM - 4:25 PM, Jul 17

● **Specifying Partner Enzyme Interactions with Cytochrome P450 and Characterizing a New Enzyme in the Artemisinin Biosynthetic Pathway**

🕒 4:25 PM - 4:40 PM, Jul 17

● **Rapid reconstitution of multiple phenylpropanoid pathways using multiplex CRISPR/Cas9 enables optimization of curcumin biosynthesis in yeast**

🕒 4:40 PM - 4:55 PM, Jul 17

● **Lightning Talks - Poster Advertising**

🕒 4:55 PM - 5:15 PM, Jul 17

5:30 PM

Poster Presentation I

🕒 5:30 PM - 7:00 PM, Jul 17

📍 Big Ten B & C

1 Subsessions

● **Reception**

🕒 5:30 PM - 7:00 PM, Jul 17

Tue, Jul 18, 2023

7:30 AM

Breakfast

🕒 7:30 AM - 8:30 AM, Jul 18

📍 Big Ten B & C

8:30 AM

Symposium IV: Plant Synthetic Biology

🕒 8:30 AM - 11:05 AM, Jul 18

📍 Big Ten A

👤 **Chair**



Michael A. Phillips

Associate Professor
Univ of Toronto - Mississauga

9 Subsessions

● **Announcements**

🕒 8:30 AM - 8:35 AM, Jul 18

● **Keynote - Yasuo Yoshikuni | Opportunities for Facility-Enabled Science at the DOE Joint Genome Institute (JGI)**

🕒 8:35 AM - 9:05 AM, Jul 18

● **Arthur Neish Award Presentation - Benjamin Lichman | Monoterpenoid enzymology and evolution in the mint family**

🕒 9:05 AM - 9:25 AM, Jul 18

● **Break (20 min)**

🕒 9:25 AM - 9:45 AM, Jul 18

● **The GAENTRY System outperforms the binary plasmid in deliverable DNA cargo size, plant transformation efficiency, and transgenic plant quality.**

🕒 9:45 AM - 10:00 AM, Jul 18

● **Pinoresinol/lariciresinol reductase and secoisolariciresinol dehydrogenase involved in specific production of the (+)-enantiomer of matairesinol in *Daphne genkwa***

🕒 10:00 AM - 10:15 AM, Jul 18

● **Improving the flavour of yellow peas using CRISPR/Cas9 gene-editing**

🕒 10:15 AM - 10:30 AM, Jul 18

● **Ancestral pathway reconstruction: engineering the Entner-Doudoroff pathway for terpene biosynthesis in higher plants**

🕒 10:30 AM - 10:45 AM, Jul 18

● **Break (20min)**

🕒 10:45 AM - 11:05 AM, Jul 18

11:05 AM

Symposium V: Chemistry, Food Security and Nutrition

🕒 11:05 AM - 1:00 PM, Jul 18

📍 Big Ten A

👤 Chair



Satya Swathi Nadakuduti

Assistant Professor
University of Florida

6 Subsessions

● **Keynote - Jessica Cooperstone: Integrating plant science and human nutrition to understand phytochemical bioactivity in crops**

🕒 11:05 AM - 11:35 AM, Jul 18

● **Flocculation of oleaginous green algae with *Mortierella alpina* fungi for valuable bioproducts**

🕒 11:35 AM - 11:50 AM, Jul 18

● **Intradiol ring-cleavage dioxygenases and their role in the xenobiotic detoxification and host adaptation in Tetranychidae mites**

🕒 11:50 AM - 12:05 PM, Jul 18

● **TuGSTmu12, but not its close homologue TuGSTmu06, is required for detoxification of the glucosinolate-myrosinase defenses and *Tetranychus urticae* adaptation to *Arabidopsis***

🕒 12:05 PM - 12:20 PM, Jul 18

● **Unraveling the Role of Carotenoid Beta-Hydroxylases in Tetraploid Wheat**

🕒 12:20 PM - 12:35 PM, Jul 18

● **Lightening Talks - Poster Advertising**

🕒 12:35 PM - 1:00 PM, Jul 18

1:00 PM

Lunch

🕒 1:00 PM - 2:00 PM, Jul 18

📍 Big Ten C

2:00 PM

Symposium VI: Botanical Medicine, Flavors and Fragrances

🕒 2:00 PM - 3:25 PM, Jul 18

📍 Big Ten A

👤 Chair



Heejin Yoo

Assistant Professor
University of Utah

5 Subsessions

● **Keynote - Cory Harris: Tapping the biological and chemical diversity of North America's medicinal and food plants**

🕒 2:00 PM - 2:30 PM, Jul 18

● **Biochemical basis for the formation of organ-specific volatile blends in mint**

🕒 2:30 PM - 2:45 PM, Jul 18

● **Cannabis Sampling Recommendations from a Course-based Undergraduate Research Experience (CURE), from Seeds to Statistics**

🕒 2:45 PM - 3:00 PM, Jul 18

● **Cytosolic Monoterpene Biosynthesis in Geraniums is Emblematic of Rosids**

🕒 3:00 PM - 3:15 PM, Jul 18

● **Biosynthesis of Δ^1 -piperidine-derived alkaloids in *Flueggea suffruticosa***

🕒 3:15 PM - 3:25 PM, Jul 18

3:25 PM

PSNA Members Meeting

🕒 3:25 PM - 3:55 PM, Jul 18

📍 Big Ten A

4:00 PM

Career Workshop

🕒 4:00 PM - 5:15 PM, Jul 18

📍 Big Ten A

👤 Chair



Ray Collier

Wisconsin Crop Innovation Center- UW-Madison

2 Subsessions

● **Keynote - Garret Miller: Transitioning from my PhD to an Early-Career Industry Scientist**

🕒 4:00 PM - 4:30 PM, Jul 18

● **Panel Discussion**

🕒 4:30 PM - 5:15 PM, Jul 18

5:15 PM

Networking

🕒 5:15 PM - 6:00 PM, Jul 18

📍 Big Ten B & C

CV and Mock Interview Workshop

🕒 5:15 PM - 6:00 PM, Jul 18

📍 Centennial ABC

6:00 PM

Poster Session II

🕒 6:00 PM - 7:30 PM, Jul 18

📍 Big Ten B & C

1 Subsessions

● Reception

🕒 6:00 PM - 7:30 PM, Jul 18

8:00 PM

Trivia Night

🕒 8:00 PM - 10:00 PM, Jul 18

📍 Harper's Restaurant and Brewpub - Patio

131 Albert St, East Lansing

<https://www.harpersbrewpub.com>

Wed, Jul 19, 2023

7:30 AM

Breakfast

🕒 7:30 AM - 8:45 AM, Jul 19

📍 Big Ten B & C

Women's Breakfast

🕒 7:30 AM - 8:45 AM, Jul 19

📍 Centennial ABC

8:45 AM

Symposium VII: Indigenous Connections

🕒 8:45 AM - 10:25 AM, Jul 19

📍 Big Ten A

👤 Chair



Bjoern Hamberger

Conference organization. Faculty.
Michigan State University

6 Subsessions

● Announcements

🕒 8:45 AM - 8:50 AM, Jul 19

● Keynote - Isabel Desgagne-Penix: Nimeshkanam – My Path From Phytochemistry To Community-Based Research

🕒 8:50 AM - 9:20 AM, Jul 19

● Small Fruits, Big Benefits

🕒 9:20 AM - 9:40 AM, Jul 19

● Bridging Research and Cultures: Exploring Plant Phytochemistry and Cross-Cultural Collaboration for Sustainable Applications

🕒 9:40 AM - 9:50 AM, Jul 19

● Open Discussion

🕒 9:50 AM - 10:10 AM, Jul 19

● Break (15min)

🕒 10:10 AM - 10:25 AM, Jul 19

10:25 AM

Symposium VIII: Ecology, Plant-Environment Interactions

🕒 10:25 AM - 1:00 PM, Jul 19

📍 Big Ten A

👤 Chairs



Li Tian and Dae-Kyun Ro

9 Subsessions

● **Keynote - Andrea Glassmire; Phytochemical diversity and its ecological role in plant-insect interactions**

🕒 10:25 AM - 10:55 AM, Jul 19

● **Synergy between plant defense flavonoids and an entomopathogenic baculovirus biopesticide**

🕒 10:55 AM - 11:10 AM, Jul 19

● **Probing the sequestration of quassinoids by the spotted lanternfly, *Lycorma delicatula* White**

🕒 11:10 AM - 11:25 AM, Jul 19

● **Break (20min)**

🕒 11:25 AM - 11:45 AM, Jul 19

● **Spatio-temporal chemical modulation of root-associated-microbial communities in the Brassicaceae family**

🕒 11:45 AM - 12:00 PM, Jul 19

● **Investigating the mechanism of high-CO₂-mediated inhibition of isoprene emission**

🕒 12:00 PM - 12:15 PM, Jul 19

● **The Role of Amino Acids in Plant Programmed Cell Death during Plant Immunity**

🕒 12:15 PM - 12:30 PM, Jul 19

● **Examining the function of specialized metabolites in context under natural settings**

🕒 12:30 PM - 12:45 PM, Jul 19

● **Unleashing Cellular Destiny: IRE1-Proteasome Signaling Governs Plant ER Proteotoxic Stress**

🕒 12:45 PM - 1:00 PM, Jul 19

1:00 PM

PSNA 2024 Announcement

🕒 1:00 PM - 1:15 PM, Jul 19

📍 Big Ten A

👤 Speaker



Rocio Diaz de la Garza

Professor
Tecnológico de Monterrey

1:15 PM

PSNA Executive Committee Meeting

🕒 1:15 PM - 2:00 PM, Jul 19

📍 Big Ten A

Lunch

🕒 1:15 PM - 2:00 PM, Jul 19

📍 Big Ten C

2:00 PM

Free Time / Excursions

🕒 2:00 PM - 5:30 PM, Jul 19

5:30 PM

Group Photo

🕒 5:30 PM - 6:00 PM, Jul 19

📍 Kellogg - East Patio

6:00 PM

Reception

🕒 6:00 PM - 9:00 PM, Jul 19

📍 Big Ten B & C

Banquet & Award Ceremony

🕒 6:00 PM - 9:00 PM, Jul 19

📍 Big Ten B & C

Thu, Jul 20, 2023

7:30 AM

Breakfast

🕒 7:30 AM - 8:30 AM, Jul 20

📍 Big Ten B & C

8:30 AM

Symposium IX: Computational Biology

🕒 8:30 AM - 11:20 AM, Jul 20

📍 Big Ten A

👤 **Chair**



Sue Rhee

Foundation Professor
Michigan State University

10 Subsessions

● Announcements

🕒 8:30 AM - 8:35 AM, Jul 20

● Keynote - John Morgan: Mathematical modeling of lignin biosynthesis

🕒 8:35 AM - 9:05 AM, Jul 20

● Arthur Neish Award Presentation - Gaurav Moghe: Peeling the onion: Unraveling layers and layers of causes for metabolic evolution in the wild tomato *Solanum habrochaites*

🕒 9:05 AM - 9:25 AM, Jul 20

● Break (20 min)

🕒 9:25 AM - 9:45 AM, Jul 20

● Nanoscale Interactions of Isoprene with Membrane Bilayers and Proteins

🕒 9:45 AM - 10:00 AM, Jul 20

● Quantifying Passive Permeation of Small Molecules Across Sorghum Lipid Bilayers with Molecular Simulation

🕒 10:00 AM - 10:15 AM, Jul 20

● Evolution of the Lignin Biosynthetic Network across Grasses and Non-grass Graminids

🕒 10:15 AM - 10:30 AM, Jul 20

● A reconstructive and deconstructive approach for unravelling the complete diterpene library.

🕒 10:30 AM - 10:45 AM, Jul 20

● Spatially-Resolved Reaction Diffusion Models of Photosynthetic Carbon Assimilation and Biochemistry

🕒 10:45 AM - 11:00 AM, Jul 20

● Break (20 min)

🕒 11:00 AM - 11:20 AM, Jul 20

11:20 AM

Best Presentation Awards

🕒 11:20 AM - 12:00 PM, Jul 20

📍 Big Ten A

12:00 PM

Closing Remarks

🕒 12:00 PM - 12:15 PM, Jul 20

📍 Big Ten A

🗣️ Speaker



Bjoern Hamberger

Conference organization. Faculty.
Michigan State University