2024 WSU Molecular Plant Sciences Retreat
Saturday, February 24th, CUE 203,
Zoom Meeting: 988 0009 7696 Passcode: MPS2024

1:00 pm  Prof. Laura Bartley, MPS Program Director
Title: Welcome and information about research resources at WSU

1:20-1:45 MPS Graduate Students Organization
Title: Exploring the Palouse and Beyond: Recreation and Community

1:45-2:45 Session I: Chair, Sean McGuire
Tana Rayburn, Institute of Biological Chemistry, Prof. Sanja Roje’s laboratory
Title: A long noncoding RNA is involved in regulating flavin biosynthesis in Arabidopsis
Synopsis: Although the cofactors FMN and FAD, known as flavins, are essential for metabolic reactions, their regulation remains poorly understood. Our lab has implicated a long noncoding RNA (lncRNA) in the maintenance of flavin homeostasis in Arabidopsis. This discovery offers novel insight into how a key metabolic process is maintained, as well as a new role for plant lncRNAs.

Dr. Prabu Gnanasekaran (Department of Plant Pathology, Prof. Hanu Pappu’s laboratory
Title: The biochemical and molecular dissection of plant-virus interactions.
Synopsis: Potato virus Y (PVY) is an economically important pathogen. Understanding PVY virus-host interactions could provide important insights into plant immunity. We perform yeast two-hybrid screens on a Nicotiana benthamiana cDNA library using PVY-encoded Nla-pro as bait and found that Indole-3-acetic acid-amido synthetase plays a crucial role in PVY pathogenesis.

Jacob Lewis, Department of Chemistry, Prof. Chul-Hee Kang’s laboratory
Title: Engineering Biofuel and Crop Resilience in Grasses
Synopsis: The flavonoid pathway is adjacent to the monolignol pathway and generates ROS scavengers. Chalcone Synthase, the committed step of the flavonoid pathway is characterized as having “catalytic promiscuity” that is rectified by metabolon formation with Chalcone Isomerase and Chalcone Isomerase-Like protein. We characterize enzymes structurally and enzymatically to understand the flavonoid pathway in grasses.

Haley Schrader, School of Biological Sciences, Prof. Asaph Cousins’ laboratory
Title: Summer in Death Valley: Leveraging an extremophile plant to investigate photosynthetic enzyme thermal tolerance
Synopsis: PEP carboxylase catalyzes the first irreversible and often rate limiting step of the C₄ photosynthetic pathway. I investigate the thermal kinetic response of PEP carboxylase from an extremophile plant to ultimately identify protein features that confer thermal stability.

2:45-3:15 Coffee Break ☕

3:15-4:45 Session II: Chair, Tana Rayburn
Sean McGuire, Institute of Biological Chemistry, Prof. Phil Bates’ Laboratory
Title: The first intron of DGAT1 regulates pollen and embryo lipid accumulation
Synopsis: Tissue-specific expression of triacylglycerol biosynthetic genes is critical during pollen and embryo development, with mutants being reproductively lethal. By pairing the 5’ promoter region and first intron of DGAT1 in Arabidopsis, the lethality can be complemented. This finding can be extended to similar DNA elements that play critical roles throughout plant metabolism.
Dr. Bing Liu, Institute of Biological Chemistry, Prof. Tom Okita’s laboratory  
**Title:** The RNA landscape of RNA binding proteins in developing rice seeds  
**Synopsis:** Prolamine mRNAs are asymmetrically distributed to the ER membranes that bound spherical prolamine intracisternal inclusions, while glutelin mRNAs are localized to adjacent cisternal ER. The cis-regulatory targeting RNA signals (zipcodes) and the trans-RNA binding proteins (RBPs) that recognize these zipcodes form a complex protein interactome. My work tests the hypothesis that RBPs interact with RNAs encoding a functionally-related protein or localized in the same intracellular region. I employed the seCLIP approach, which involves the UV-crosslinking of RNA-protein complexes, immunoprecipitation of selected complexes, and the identification of RNA targets and their binding sites by next-generation sequencing.

Introduction of keynote speaker: Prof. Norman Lewis, WSU Regents Professor, Institute of Biological Chemistry

Dr. Oliver Corea, Segra International  
**Title:** A Molecular Pathway to the Cannabis Industry  
**Synopsis:** As a Molecular Plant Sciences student, Oliver Corea, PhD (’11) did not foresee a future in the cannabis industry. However, Dr. Corea was already gaining knowledge and experience through his research and studies at WSU that would prepare him to dive into the industry just as recreational cannabis became legal in his home country of Canada. Over the next six years, he worked in leadership positions at two cannabis companies, wearing many hats and gaining valuable insights into the various ways science is helping this industry grow and mature. In this presentation, he will discuss his own path from MPS graduate to Director of Applied Genomics at Segra International, as well as some other routes those with a foundation in plant molecular biology and biochemistry might take into this exciting industry.

5:00-8:00 Buffet dinner and poster viewing CUE 518, 5th Floor.