

AUGUST 2021 BIOCHEMISTRY NEWS



Welcome Back Everyone!

August Graduates...



Fabiola Muro Villanueva
Next Stop: Post-Doc Chapple lab

NEW FACES...



Heidi Fornes recently joined the Biochemistry Department as the new Undergraduate Program Administrator. Please feel free to stop by her office in BCHM 121 to say hello and introduce yourself.

“I am an alum from the Purdue College of Ag in the Food Science program. While a student, I worked in Dr. Nelson’s (who Nelson Hall was named after) research lab on the aseptic processing of tomato paste and orange juice. While I was a student at Purdue, I also played in the PMO handbell choir, and have continued playing bells since I graduated. I have a Master’s degree in Food Chemistry/minor in Organic Chemistry from North Carolina State University. I have worked in the food industry focusing on new ingredient technology at Pfizer Food Science, Cultor Food Science and Novo Nordisk. I taught chemistry and biochemistry at Ursuline College; and for the past 20 years, I taught chemistry for Vincennes University Distance Ed department. Most recently, I co-taught BCHM 307 with Dr. Hart in the spring of 2021. I’ve lived in West Lafayette for 16 years with my husband, two daughters (a junior in college and a senior in high school), and our beagle.”

UNDERGRADUATE SUMMER PROGRAMS...

Summer is a busy time for Purdue Biochemistry. We had 14 Biochemistry students participate in the MASI Summer Research program and 12 students who traveled to campus for the REU research program. Please see the list of students and their projects below.

2021 Biochemistry students who participated in MASI:

Anna Donnelly, Harpur lab, Exploiting ectopic expression systems to understand the roles of novel genes.

Ogechukwu Ezenwa, Ogas lab, Genetic analysis of Chromatin-based transcriptional repression pathway in Arabidopsis

Jacob Fawley, Ogas lab, Investigating effect of loss of *PKL* in *isw1 isw2* plants

Cody Goode, Forney lab, The Localization of Cdc14 in *Tetrahymena thermophila*

Lydia Kowalskyj, Chapple lab, Identification of Metabolic Products of Amino Acid Precursors in Arabidopsis

Micah Lehe, Tao lab, Developing Quantification Methods for N-Terminal Acetylation of Proteins

Renqiuguo Li, Dudareva lab, Identification of petunia benzaldehyde synthase

Taylor Stewart, Lohman lab, Determination and Characterization of 2-PS Substrate Analogs

Cooper Nevitt, Johal lab, Generation of maize dwarfing mutants with mutagenesis

Mario Perez-Ahuatl, Boavida lab, Determination of DMP Functional Domains through Molecular and genetic Analysis

Olivia Riedling, Wisecaver lab, Horizontal gene transfer in microbial eukaryote *Prymnesium parvum*

Jack Schwartz, Hall lab, The Role of Dimerization in the Catalytic Mechanism of Cdc14 Phosphatases

Jocelyn Sheets, Casey lab, Does level of colostrum intake dictate the abundance and activity of hepatic peroxisomes at seven days postnatal?

Caden Tuinstra, Chapple lab, LC/MS coupled to PODIUM establishes the amino acid metabolomes of *Sorghum bicolor*

2021 REU students and their projects:

Francisco Benítez Sota, Chapple lab, Understanding dwarfism in a lignin biosynthetic mutant

Ashrey Burley, Weake lab, The Impact of antioxidants on the aging eye of *Drosophila melanogaster*

Maddie Ceminsky, Gowher lab, Determining the role of the interaction of hnRNP L with lncRNA Dnmt3bas in mouse embryonic stem cells

Grant Freitas, Mesecar lab, Investigating the Effects of Salt Concentration of SARS-CoV-2 3C-Like Protease

Daja Goodrich, Tao lab, A Quest to Quantify N-terminus Acetylated Peptides

Adrián Márquez Hernández, Liu lab, Identifying the regulatory roles of CAND2 in cardiac protein ubiquitination

Rebekah Lubinga, Tran lab, Cellular Localization of Dbp2 and Identification of its Interaction Partners

Kevin Velazquez Marrero, Lohman lab, Development and characterization of substrate analogs of KAS III

Daniel "Brian" Matute, Puthiyaveetil lab, TSA1 Subcellular localization and possible role in photosynthesis regulation.

Kennedy Outlaw, Lyon lab, Understanding Conformational Dynamics of Phospholipase C $\beta 3$ and its Regulation by G $\beta\gamma$

Joseph Sampson, Forney and Hall lab, Biochemical Analysis of Cdc14 Phosphatase in *Tetrahymena thermophila*

Chloe Smith, Briggs lab, Determining the Roles of Epigenetic Factors-SAS2, SAS3 and GCN5 in oxidative Stress and Antifungal Drug Resistance



Front row: Francisco Benitez Sota, Kevin Velazquez Marrero, Ashrey Burley, Maddie Ceminsky, Kennedy Outlaw, Daja Goodrich. Second row: Grant Freitas, Joe Sampson, Adrian Marquez Hernandez, Rebekah Lubinga, Brian Matute and Chloe Smith.

BIOCHEMISTRY IN THE NEWS...

Trevor Boram, in the Lohman lab, was featured in the Ag Research Spotlight for his research to overcome antibiotic resistance. Click [here](#) to read the article.

GOING THE EXTRA MILE...

Natalia Dudareva gave an opening plenary keynote presentation entitled "Plant volatile emission: beyond the traditional view" at the 60th Annual Meeting of the Phytochemical Society of North America (PNAS), Kelowna, British Columbia, Canada, Virtual, July 25-30, 2021.

Robert Auber (Wisecaver lab) gave an oral presentation, "Highly toxic strain of *Prymnesium parvum* is an allodiploid hybrid" at the Phycological Society of America's 2021 virtual meeting in July.

Robert Auber (Wisecaver lab) also presented a poster, "Genome assembly and coexpression analysis of *Lithospermum erythrorhizon* identifies shikonin pathway gene candidates and provides evolutionary insight into shikonin biosynthesis" at the virtual meeting of the Plant Biology Worldwide Summit this July.

Joshua Trujillo (post-doc. Wisecaver lab) presented a poster, "Genotypic variation is sufficient for recovery of robust gene co-expression networks in Brassicas and provides insight into the evolution of glucosinolate biosynthesis post allopolyploidization" at the virtual meeting of the Plant Biology Worldwide Summit this July.

Katherine Eastman (Wisecaver lab) gave an oral presentation, "Characterizing the conservation and divergence of cyanogenic glucoside biosynthetic pathways in the model grass *Setaria viridis*" at the virtual meeting of the Plant Biology Worldwide Summit this July.

Amanda Pendleton (post-doc, Wisecaver lab) gave an oral presentation, "Gene coexpression networks identify drought-responsive secondary metabolism in the green foxtail (*Setaria viridis*)" at the virtual meeting of the Plant Biology Worldwide Summit this July.

SAFETY CORNER...

Safety Training

Fall is the best time to not only train new personnel, but to perform required refresher training.

Please have your students/employees go to the REM website and perform the training required for your lab/space. <https://www.purdue.edu/ehps/rem/training/index.html>

All Lab personnel MUST complete "Chemical Hygiene Plan – Initial or Refresher"- annually

New Lab personnel MUST complete "Lockout Tagout" training upon initial work in any lab

Non-lab personnel MUST complete – "Hazard Communication – Awareness" training – annually

PI's should review all the training available, and assign as needed for their space.

Recording training is critical, and keeping a signed copy of training in your yellow lab CHP binder is a good way to track training.

GRANTS...

Natalia Dudareva, along with Dr. Ying Li (HLA) received a \$1,002,041 NSF-MCB grant for three years to elucidate the interplay between two chromatin regulators HDA8 and ELP3 in dynamic control of primary and secondary metabolic networks (08/01/2021- 07/31/2024).

Mark Hall received a \$9,750 Core Pilot Award for his proposal *Proteomic characterization of Cdc14 phosphatases in fungal pathogens*.

Michelle Lihon, in the Tao lab, received \$123,374 from the NIH Admin Supplement for Diversity to support her research for two years.

RECENT PUBLICATIONS...

Frachon, L., S.A. Stirling, F. P. Schiestl, **N. Dudareva**. 2021. Combining biotechnology and evolution for understanding the mechanisms of pollinator attraction. *Current opinion in biotechnology* **70**:213-219.

Shaltiel-Harpaz, L., M. Yahyaa, B. Nawade, **N. Dudareva**, A. Ibdah. 2021. Identification of a wild carrot as carrot psylla (*Bactericera trigonica*) attractant and host plant chemistry. *Plant Science* **311**:111011.

Osman, A., B. Yan, Y. Li, K. D. Pavelko, J. Quandt, A. Saadalla, M. P. Singh, **M. Kazemian**, F. Gounari, K. Khazaie. 2021. TCF-1 controls T_{reg} cell functions that regulate inflammation, CD8⁺ T cell cytotoxicity and severity of colon Cancer. *Nature Immunology*. Online ahead of print

Canaria, D. A., B. Yan, M.G. Clare, Z. Zhang, G. A. Taylor, D. L. Boone, **M. Kazmian**, M. R. Olson. 2021. STAT5 Represses a STAT3-Independent Th17-like Program during Th9 Cell Differentiation. *The Journal of Immunology*. Online ahead of print.

Hall, H., B.R. Cooper, G. Qi, A.B. Wijeratne, A. L. Mosley, **V.M. Weake**. 2021. Quantitative proteomic and metabolomic profiling reveals altered mitochondrial metabolism and folate biosynthesis pathways in the aging *Drosophila* eye. *Mol Cell Proteomics*. Online ahead of print.

IMPORTANT DATES...

Please join us for the Department of Biochemistry Seminar Series - All seminars begin at 3:30 pm, in WSLR 116, unless noted. In-person and virtual seminars will be available via zoom.

Join Zoom Meeting

<https://purdue-edu.zoom.us/j/94957989438>

Aug. 23	First Day of Classes
Aug. 31	Gavin Williams, Professor of Chemistry, North Carolina State University (virtual)
Sept. 6	Labor Day Holiday - No classes
Sept. 7	Brock Harpur, Asst. Professor of Entomology, Purdue University (virtual)
Sept. 14	Sujith Puthiyaveetil, Assistant Professor of Biochemistry, Purdue University
Sept. 21	Karla Satchell, Professor of Microbiology-Immunology, Northwestern University