DEPARTMENT OF BIOLOGICAL SCIENCES
COLLEGE OF SCIENCE
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BIOsphere

September 2022 Volume 9 Issue 3

Faculty Promotions

Congratulations to our faculty on their promotion. Drs. **Ana Paula Alonso** and **David Hoeinghaus** were promoted to the rank of Professor, Dr. **James (Jim) Bednarz** was promoted to Principal Lecturer, and Drs. **Ana Paula Hoeinghaus** and **Jessica Moore** were promoted to Senior Lecturer.

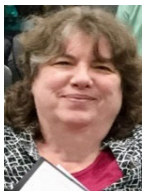

Dr. Ana Paula Alonso


Dr. David J. Hoeinghaus


Dr. James Bednarz

Dr. Ana Paula Alonso, the 2020 recipient of UNT's Early Career Award for Research and Creativity, is a plant biochemist who uses innovative systems level approaches to address Global Challenges related to food and energy security. Her unique expertise in ^{13}C-fluxomics and mass spectrometry-based metabolomics has provided novel insights in seed and plant metabolism. She has been and continues to be highly involved in collaborative and interdisciplinary research with talented colleagues at UNT and in other institutions and in offering courses in Cell Biology, and Mass Spectrometry based Metabolomics. She feels particularly fortunate and proud to work daily with an amazing team of junior and senior scientists in her lab and the BioAnalytical Facility. More on Dr. Alonso's research can be found at https://bdi.unt.edu/ana-alonso and https://scholar.google.com/citations?user=1YdK0nMAAAAJ&hl=en.


Dr. Ana Paula Hoeinghaus


Dr. Jessica Moore

Associate Chair **Dr. David J. Hoeinghaus** is an ecologist with expertise in responses of populations, communities and ecosystems to environmental change. He teaches Community Ecology, and Fish Diversity and Ecology. Dr. Hoeinghaus' research integrates basic and applied science to advance mechanistic understanding of ecological processes and provide tools for management and conservation of imperiled species and ecosystems. Current primary research foci include elucidating and predicting: 1) metapopulation, metacommunity and food web responses to hydrologic modification and riverscape connectivity, 2) responses of stream biodiversity and food web structure to land-use and land-cover changes, such as in urbanizing environments and rural landscapes in North Texas, and associated with deforestation in the Amazon, and 3) population, community and food web responses to extreme weather events, such as drought and associated with ENSO dynamics, to predict consequences of continued global climate change for aquatic diversity. More on Dr. Hoeinghaus research can be found at http://biol.unt.edu/~djhoeinghaus/ and https://scholar.google.com/citations? user=tX9SrQ0AAAAJ&hl=en.

Dr. James (Jim) Bednarz previously taught at Arkansas State University, Collin College, and as an adjunct professor at UNT, prior to his employment in the Department as a full-time faculty member in 2016. His responsibilities include teaching courses in Ecology and Ornithology, advising Biology and Ecology majors, and providing undergraduate students research opportunities in ecology. Besides teaching, Jim's primary professional interests involve closely mentoring both undergraduate and graduate students to address basic and applied ecological research questions. Jim and his students are currently researching the causes of population declines in American Kestrels, details of the mostly un-studied breeding system of the Painted Bunting, avian community responses to habitat restoration, and cooperative hunting in Harris's Hawks. In his new rank, Jim plans to work toward further enhancing the Ecology degree program and to facilitate quality research opportunities and training for students interested in ecological and conservation science.

Dr. Ana Paula Hoeinghaus is an ecologist with broad interests in biodiversity and conservation, and expertise in tropical fish ecology and fish parasitology. She joined the Department of Biological Sciences as a Lecturer and Advisor in Fall 2018. She teaches Biodiversity and Conservation of Animals, Community Ecology, and the introductory course Biology for Science Majors II. As an advisor, she is involved in activities supporting undergraduate students and degree programs, including recruitment events, new and transfer student orientations, evaluation of transfer credits, and student advising. She is passionate about the success of Biology students and our programs.

Dr. Jessica Moore is a Developmental Biologist and Geneticist who teaches and advises students in Department of Biological Sciences. She teaches Cell Biology, Genetics and the introductory course Biology for Science Majors I to about 700 students total every academic year. As an advisor to our undergraduate students she has various duties, but her main job is to help students stay on the path to completing one of the 5 degrees. In August of this year she began a 3-year appointment to the Texas Board of Higher Education, Biology Field of Study subcommittee as the representative for UNT and the interests of the students.

Faculty and Staff Appointments

Welcome to our new faculty and staff!


Dr. Patrick Horn


Angela Tanzillo-Swarts

Dr. Patrick Horn has joined the Department of Biological Sciences and BioDiscovery Institute as an Assistant Professor. He grew up in Arlington, TX and attended UT-Austin for his undergraduate education. He started his undergraduate research training at a 3M internship prior to completing his graduate work at UNT with a PhD in plant biochemistry. After post-doctoral work at Michigan State University, he started a research lab at East Carolina University. Now excited to return home to DFW and UNT, Dr. Horn's lab will center on the identification and characterization of proteins involved in bioproduct metabolism. Acquired knowledge from these projects will be used in translational efforts to improve, through metabolic engineering, bioproduct metabolism in crop systems under dynamic environmental conditions.

Angela Tanzillo-Swarts, MBE has joined the Department of Biological Science as a Clinical Assistant Professor. She will be working with Drs. Teresa Golden and Charlie Williams to further develop the Forensic Science Program. She brings with a her a wealth of practical knowledge from over two decades as a professional forensic scientist, with specialized expertise in Forensic Molecular Biology, Bloodstain Pattern Analysis, Crime Scene Investigation, and Laboratory Quality Assurance. Previously, she was the technical director of the Forensic Biology/DNA Unit, among other roles, with an accredited international laboratory.

Dr. Jason Bohenek has joined the Department of Biological Sciences as a Clinical Assistant Professor. He earned his PhD at the University of Mississippi in 2019 and was a postdoc at the Ohio State University. He is teaching a two-semester sequence of Biostatistics for graduate students based in the R programming language. His research interests lie in aquatic community ecology and ecophysiology where he investigates how patch quality affects community assembly and developmental plasticity. Dr. Bohenek's publications can be found at https://scholar.google.com/citations?user=K1SDwq0AAAAJ&hl=en.


Dr. Jason Bohenek


Dr. Hyun-Joo Nam

Dr. Hyun-Joo Nam joined the Department of Biological Sciences as a lecturer and faculty advisor for our students at the Frisco campus. Dr. Nam's course offerings at Frisco include Genetics, Cell Biology and Animal Physiology. Dr. Nam received her PhD in Cellular and Developmental Biology from Harvard University. Her research interest includes structure-function studies of viruses, proteins, and protein-DNA complexes and engineering biomolecules for biotechnology applications (https://scholar.google.com/citations?user=umHALVMAAAAJ&hl=en).

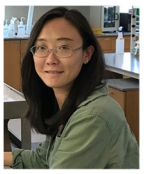

Dr. Digar Singh

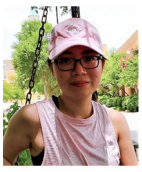

Dr. Md Ashraful Islam

Dr. Digar Singh joined the Department of Biological Sciences and the BioDiscovery Institute as a Postdoctoral Research Associate in Dr. Ana Alonso's group. He obtained his PhD in Biotechnology from the Indian Institute of Technology, Guwahati, and worked as a Research Professor at Konkuk University in the Republic of Korea. Dr. Singh brings to UNT expertise in microbial interactions and Mass Spectrometry-based untargeted metabolomics (https://scholar.google.co.in/citations?hl=en&user=ZDbj6foAAAAJ&view_op=list_works&sortby=pubdate) study the metabolism of fungal endophytes isolated from wild Rubiaceae species.

Dr. Md Ashraful Islam joined the Department of Biological Sciences as a Postdoctoral Research Associate. Dr. Ashraful, a native of Bangladesh, received his PhD in Plant Pathology from Northwest A&F University in China and his MS in Agronomy and BSc (Hons) in Agriculture from Bangladesh Agricultural University. Prior to joining UNT, Dr. Ashraful held a postdoctoral position at Shanxi Agricultural University in China. He has extensive experience working in the areas of molecular plant pathology and enhancing agronomic traits in cereal crops (https://scholar.google.com/citations?user=8kGynLQAAAAJ&hl=en). At UNT, Dr. Ashraful will work in Dr. Jyoti Shah's Lab on a US Department of Agriculture (USDA)-Agricultural Research Services-funded project to develop new strategies for controlling Fusarium head blight in wheat. Fusarium head blight is a devastating fungal disease of wheat, barley and other small grain cereals that globally impacts grain productivity and quality. Dr. Islam will also contribute his expertise to a USDA National Institute of Food and Agriculture (NIFA)-funded project to study the molecular and physiological processes associated with cross-kingdom interaction between wheat and *Fusarium graminearum*, the principal causative agent of Fusarium head blight in wheat.

Dr. Yingqi Cai has re-joined Dr. Chapman's Lab as a post-doc after graduating from UNT in December 2018 and doing a post-doc in John Shanklin's group in the Biology Department at Brookhaven National Laboratory. Dr. Cai's expertise is in plant biochemistry and membrane lipid dynamics and metabolism. More on her research can be found at https://scholar.google.com/citations?user=D42nW04AAAAJ&hl=en.

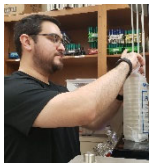

Dr. Yingqi Cai


Duyen Pham

Duyen Pham joined the Department of Biological Sciences and the BioDiscovery Institute in August 2022, as a Research Assistant in the Alonso Lab. She obtained a BA in Biology from University of North Texas in Denton, TX. She is working with Dr. Cintia Arias, assisting with the biochemical characterization of soybean transgenics and their application as a sustainable source for aquafeeds. Duyen believes that it is a great opportunity to acquire new skills and grow her interest in research and development in order to prepare for graduate school.

Denice (Deni) Gallagher joined the Department of Biological Sciences as Scientific Laboratory Technician for freshman biology labs in September 2022. She was previously working as the Graduate Secretary for the Environmental Science Graduate Program at UNT. Deni earned her MS in Environmental Science from UNT, her BS in Plant Science from Texas A&M, and an AAS in Aviation Technology/Professional Pilot from Palo Alto College, San Antonio, TX. She enjoys camping, quilting/sewing, reading, and Legos.


Deni Gallagher


John Mears

John Mears (Matt) has joined the Department of Biological Sciences as the Microbiology Lab Technician. He graduated with his Bachelor's in Biology in 2014. He has lived in Denton since 2015. John worked at Texas Woman's University in the Chemistry Department for nearly 7 years. John is excited to put his degree to good use for educating other students.

Thesis and Dissertation

Congratulations to our graduate students who successfully defended their thesis/dissertation.


Leah Schneider

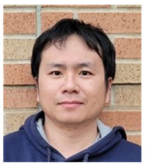

Kelsey Biles


Rajashree Pradhan

Leah Schneider successfully defended her PhD dissertation titled, "Alterations in the Expression of Proteins Associated with Non-Alcoholic Fatty Liver Disease Observed in the Liver of the C57Bl/6 Wild-type Male Mouse in Response to Exposure of Mixed Vehicle Emissions and/or High Fat Diet Consumption". Her major advisor was Dr. Amie Lund. Leah and her family have relocated to Dayton, OH where she is employed as a Senior Research Scientist with CFD Research Corporation. Her work with the research firm will primarily focus on investigating the toxicological effects of compounds our military members encounter in deployed environments.

Kelsey Biles successfully defended her PhD dissertation titled, "Migration Tracking, Survival, and Pairing Behavior of American Kestrels Wintering in North Central Texas." Her major advisors were Drs. Jim Bednarz and Andrew Gregory. Kelsey is currently working as the Conservation Director at Houston Audubon.


Sara Joseph


Yao-Chuan Yu


Julia Migliore

Rajashree Pradhan successfully defended her PhD dissertation titled, "Identification and characterization of two putative sulfate transporters essential for symbiotic nitrogen fixation in *Medicago truncatula*". Her major professor was Dr. Rebecca Dickstein. Rajashree will be pursuing a postdoctoral associate position at the Donald Danforth Plant Science Center.

Sara Joseph successfully defended her Environmental Science Master's Thesis titled. "Space Use, Microhabitat and Macrohabitat Use of the Three-toed Box Turtle (*Terrapene carolina*) in North Texas". Her major professor was Dr. Jaime Jimenez. Currently she is in her first PhD semester at UNT in Dr. Andrew Gregory's Lab and she would like to eventually become a professor.

Yao-Chuan Yu successfully defended his PhD dissertation titled, "*Medicago truncatula* NPF1.7: structure-function assessment and potential as a phytohormone transporter". His major professor was Dr. Rebecca Dickstein. Yao-Chuan is currently a post doc in Dr. Calvin Henard's Lab.

Julia Migliore successfully defended her Master's thesis titled, "Seeing in the Light: Using Expansion Microscopy to Achieve Super-Resolution in Transmitted Light". Her major advisor was Dr. Douglas Root.

Amanda Reynolds Kirby successfully defended her PhD dissertation titled, "Temperature Change and its Consequences for the Physiology of the Eurythermic Sheepshead Minnow." Her major professor was Dr. Dane Crossley. Amanda is currently employed at the University of North Georgia as an Assistant Professor of animal physiology.

Alumni News


Dr. Devasantosh Mohanty

Dr. Devasantosh Mohanty joined Bayer Crop Science in St. Louis where he will be working on the development of noble and sustainable weed management strategies for cash crops. Dr. Mohanty received his PhD in Biochemistry and Molecular Biology from UNT in Spring 2022. He was a member of the BioDiscovery Institute. His major professor was Dr. Jyoti Shah. Dr. Mohanty's research at UNT was in the area of inducible immunity in plants. At UNT, he was the recipient of the Ricco Ethics Award (2018), People's Choice Award at the Doctoral level 3MT competition (2018), and the Outstanding Teaching Assistant in Microbiology Award (2020). More on his research publications can be found at https://scholar.google.com/citations?user=PWI42LIAAAAJ&hl=en

Biology Research and Training News

Researchers in the BioDiscovery Institute received the first W.M. Keck Foundation grant in UNT history — for a first-of-its-kind study. With the $1.4 million grant, they'll explore the potential for developing fungal-derived pharmaceuticals like penicillin in plant hosts, for more accessible and environmentally sustainable medicine. "What we're thinking long-term is that if plants can store medicines in seeds, you eat the seeds, and the medicine is already contained. You don't have all these factories, you don't need any chemicals — it's just there and available," says **Dr. Elizabeth Skellam**, lead researcher and assistant professor of chemistry. The project grew from a conversation with **Dr. Kent Chapman**, Regents Professor of biological sciences and director of the institute. Rounding out the team are **Dr. Ana Paula Alonso**, BioDiscovery Institute member and associate professor of biological sciences, who studies plant biochemistry, and **Dr. Michael Carroll**, professor of economics, who will evaluate the economic feasibility of the manufacturing process. Read the full article and find out more about the research at https://news.unt.edu/news-releases/unt-researchers-earn-14m-keck-foundation-grant-study-greenhouse-production-fungal

Left to right: Marie Muniz, Brandon Meadows and Celia Ault


Hannah Lusk

The research of **Hannah Lusk**, who as an undergraduate visiting research scholar worked a summer on her research in Dr. Jyoti Shah's lab as part of a National Science Foundation-funded collaborative project with Dr. Ruth Welti and others at Kansas State University, was the focus of a commentary, which was published in the Plant Cell Physiology (https://doi.org/10.1093/pcp/pcac119). Hannah's research (https://doi.org/10.1093/pcp/pcac088) has uncovered an important role for the non-catalytic region of the fatty acid desaturase FAD6 in lipid metabolism in *Arabidopsis thaliana*. Hannah and her research were also highlighted a recently published editorial the editorial in Plant Cell Physiology (https://academic.oup.com/pcp/pages/research-highlights-2022-09). Hannah completed her BS and MS at Kansas State University and is currently pursuing her PhD in Biochemistry at the University of California Santa Cruz.

The UNT Bird Campus Committee, a We Mean Green Fund Grant, is now offering bird walks and informational tabling events. The UNT Bird Campus Committee has over 40 UNT undergraduates working to ensure high quality avian habitat exists on the UNT campus, while providing education for the UNT community. Visit the UNT Bird Campus Instagram page for details https://www.instagram.com/untbirdcampus/?hl=en.

Extramural Grants and Contracts

Cotton Transformation Center. Cotton Incorporated. PI- KD Chapman, $360,000.

Development of advanced biocatalyst tools and resources to enable biogas-based biomanufacturing. National Science Foundation and Department of Energy. PI: Calvin A. Henard, Co-Pi: Ana P. Alonso, collaborators: Joonhoon Kim (Pacific Northwest National Laboratory), Adam Guss (Oak Ridge National Laboratory). Amount awarded: $966,898.

Developing new technologies for improving resistance to Fusarium head blight. Agricultural Research Service, US Department of Agriculture. Jyoti Shah (UNT PI); Brian Meckes (UNT Co-PI) $117,579. August 1, 2022- July 31, 2023.

Greenhouse-based Production of Fungal-Derived Medicines. W.M. Keck Foundation. PI-Liz Skellam, Co PIs - KD Chapman, AP Alonso, M Carroll, $1,400,000.

Integrating sensors, controls, and ecotoxicology with decoupled aquaponics using brackish groundwater and desalination concentrate for sustainable food production. U.S. Department of Agriculture. PI – Acevedo (CENG); Co-PIs – Mager and Li (CENG), $1,000,000.

Manipulating the Soybean Seed Oil and Protein Reserves for the Development of High Value Soybean Cultivars and Germplasm. United Soybean Board. McHale (PI); Co-PIs: Alonso (UNT $154,222), Acuna-Galindo, Edwards, Clemente, Mian, Miranda. $574,509. October 1, 2022 – September 30, 2023

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Oral Presentations

Community structure of north Texas mammals in a countryside landscape – island biogeography or habitat amount hypothesis? Presented (virtual) at the 101st American Society of Mammalogists Conference, Tucson, Arizona. McCain, W.C.S, Hoeinghaus, D.J., Castro-Arellano, I. & Jiménez J.E. 2022.

Identification and characterization of genes functioning with *HR4*, a newly identified gene conferring resistance to the green peach aphid. Fall Undergraduate Research Symposium, University of Texas-Austin; September 24th 2022. Oral presentation by Shreya Nair, Texas Academy of Mathematics and Science Student. Shreya conducted her research under the mentorship of Dr. Anil Girija in Dr. Jyoti Shah's lab.

Lignin research- past, present and future. Talk by Ricard A. Dixon at the US Department of Energy Center for Bioenergy Innovation Annual Science Meeting, Asheville, NC, June 21, 2022.

Lipid Droplet Associated Proteins (LDAPs) and the "selective" compartmentation of neutral lipids. 25th International Symposium on Plant Lipids, July 10-15, 2022, Grenoble, France. Invited presentation given by Kent Chapman. Co-authors, P. Whitehead, A. Clews, N. Doner, R.T. Mullen.

Metabolic Engineering of *Physaria fendleri* to improve hydroxy-fatty acid content. Biodiscovery Institute Seminar Series 2022, Denton, Texas, United States, September 26, 2022. Invited seminar by Jordan LaChance.

Revealing the Temporal and Spatial Organization of Storage Lipids using ^{13}C-Labeling and Mass Spectrometry Imaging in Developing Embryos of Pennycress, a Promising Source for Sustainable Aviation Fuel. American Society of Plant Biologists, Plant Biology, Portland, Oregon, July 9-13, 2022. Talk delivered by Dr. Umesh P. Yadav. Co-authors: Trevor B. Romsdahl, Kent D. Chapman, and Ana P. Alonso.

Using ^{13}C-labeling to identify the pathways involved in fatty acid synthesis in alternative crops. 25th International Symposium on Plant Lipids, Grenoble, France. July 10-15, 2022. Keynote Speaker Dr. Ana P. Alonso. Co-authors: J.C. Cocuron, E. Tsogtbaatar, C. Johnston, E. Ortiz, L.T. Garcia Navarette, C. Arias, E. Grotewold.

Poster Presentations

Arias, C. L., Volkmann K. J., Moretti A., Quach T., Kim H., Park K., Kim H. J., Shi, Y., Guo, M., Cahoon, E. B., Clemente, T. E., and Alonso, A.P. (2022). Investigating carbon distribution during embryo development in soybean events producing omega-3 fatty acids, tocotrienols and astaxanthin. Plant Biology 2022, American Society of Plant Biologists Annual Meeting, Portland, OR. July 9-13, 2022.

Johnston C., Alonso A.P. (2022). Alteration of fatty acid elongation indicates cytosolic ACCase is tied to incorporation of carbon into the plastid in *Physaria fendleri*. 25th International Symposium on Plant Lipids, Grenoble, France, July 10-15, 2022.

LaChance, J. and Alonso, A.P. (2022). A Biochemical and Metabolomic Study of Mature Leaves of *Physaria fendleri*. Plant Biology Annual Conference 2022, Portland, OR. July 9-13, 2022.

Marley, N.J., McInnes, S.J. & Jiménez, J.E. High Diversity of Tardigrada in Chile, South America. Presented at the 15th International Symposium on Tardigrada, Krakov, Poland.

McCain, C., Hoeinghaus, D., Castro-Arellano, I. & Jiménez, J. 2022. Community structure of north Texas mammals in a countryside landscape - island biogeography or habitat amount hypothesis? Poster presented at the 18th Annual Biology Graduate Students Association Research Symposium, University of North Texas, Denton. Second best poster presentation.

Malhotra, R., J.E. Jiménez & N.C. Harris. 2022. Past landscape configuration at different scales best describes current distribution of South American foxes. Presented at the 58th Annual Meeting of the Association for Tropical Biology and Conservation, Cartagena de Indias, Colombia.

Rasoul, A., Alonso, A.P. (2022). Investigating the Biosynthetic Efficiency of Pennycress (*Thlaspi arvense*) Embryos. Plant Biology 2022, American Society of Plant Biologists Annual Meeting, Portland, OR. July 9-13, 2022.

Revealing the Temporal and Spatial Organization of Storage Lipids using ^{13}C-Labeling and Mass Spectrometry Imaging in Developing Embryos of Pennycress, a Promising Source for Sustainable Aviation Fuel. American Society of Plant Biologists, Plant Biology, Portland, Oregon, July 9-13, 2022. Poster presented by Dr. Umesh P. Yadav. Co-authors: Trevor B. Romsdahl, Kent D. Chapman, and Ana P. Alonso.

Rippamonti, J.R. and Dzialowski, E.M. (2022). The role of rac GTPases in closure of the avian ductus arteriosus (*Gallus gallus*). Europhysiology 2022, Copenhagen, Denmark.

Sagun, J.V., LaChance, J., Wallace, M., Guzha, A., Chapman, K.D., and Alonso, A.P. (2022). An effective strategy for improving hydroxy- fatty acid production by *Physaria fendleri*. Plant Biology 2022, Portland, Oregon, July 9-13, 202

Spencer, A. L., Henard, J.M., Nath, S., Benedict, C., Alba, R., Henard, C.A. Diverse carbonic anhydrases support carbon dioxide-dependent growth of *Methylococcus capsulatus* Bath. Poster. Presented by PI Calvin Henard at the Molecular Basis of Microbial One-Carbon Metabolism Gordon Conference in Southbridge, MA, August 2022.

BIOsphere is a quarterly newsletter of the Department of Biological Sciences, University of North Texas

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