DEPARTMENT OF BIOLOGICAL SCIENCES
COLLEGE OF SCIENCE
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BIOsphere

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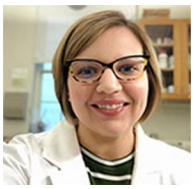
Awards and Recognition

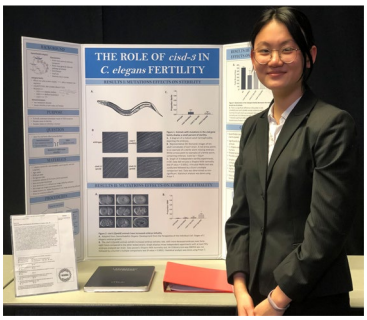
Dr. Ashley Cannon, postdoctoral fellow in Regent's Professor Dr. Kent Chapman's lab was selected as an American Society of Plant Biologists (ASPB) Ambassador and the Early Career Representative on the ASPB Education Committee. "ASPB Ambassadors are early career scientists (students and postdocs) and industry employees enlisted to communicate the mission and vision of the Society to other plant biologists and to the general public, to help ensure the ongoing vitality of the Society. These young leaders engage their campus communities in outreach activities, represent ASPB at section conferences, and contribute articles to the ASPB News. They also provide a voice for early career members in the Society, often lending input on key issues."



Dr. Ashley Cannon

Dr. Jaime Barros-Rios

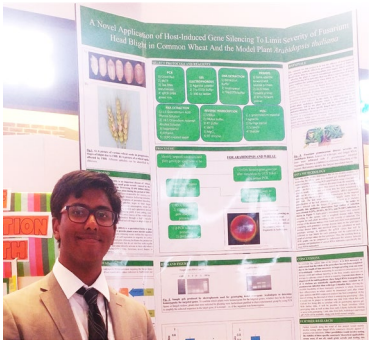
Dr. Jaime Barros-Rios, postdoctoral fellow in University Distinguished Research Professor Dr. Richard Dixon's lab received the 2019 Early Career Award from the Center for Bioenergy Innovation (CBI) funded by the Department of Energy. Dr. Barros will spend three months at the Oak Ridge National Laboratory (ORNL) and collaborate with ORNL scientists in an omics study in response to lignin modification and will spend 50% of his time assisting the CBI Central Team in the planning of the CBI Annual Review.



Zihan Zhao

Congratulations to **Zihan Zhao** for winning Best of Fair and 1st place in the Animal Sciences category at the 2019 Texas Science and Engineering Fair (TXSEF). TXSEF was held at the Texas A&M University campus, on March 29-30, 2019. Zihan will also be advancing to compete as a finalist in the Intel International Science and Engineering Fair (ISEF) at the Phoenix Convention Center in Phoenix, Arizona from May 12-17, 2019. Zihan's presentation titled '*The Role of cisd-3 in C. elegans Fertility', explores the fertility effects of cisd gene mutations on the nematode Caenorhabditis elegans"*. This project was conducted in collaboration with Skylar King, a graduate student in Dr. Pamela Padilla's lab. Zihan is a Texas Academy of Mathematics and Science (TAMS) student. **Zihan Zhao** also won 3rd place in the Cellular and Molecular Biology category at the 2019 Fort Worth Regional Science and Engineering Fair (FWRSEF), which was held at the College Park Center, University of Texas-Arlington, on February 24-25, 2019. Zihan is a Texas Academy of Mathematics and Science (TAMS) student.

Congratulations to **Athulya Nagarajan** and the Mitra sisters **Aishwarya** and **Apsara**, for winning 1st and 2nd place, respectively, in the Plant Science category at the 2019 Fort Worth Regional Science and Engineering Fair (FWRSEF) held at the College Park Center, University of Texas-Arlington, on February 24-25, 2019. Athulya's presentation titled '*A novel application of Host-induced gene silencing to limit severity of Fusarium head blight in common wheat and the model plant Arabidopsis thaliana'*, described the ability of plants expressing RNAi targeting fungal genes to promote disease resistance. This work was conducted in collaboration with Syeda Alam, graduate student in Dr. Jyoti Shah's lab. Aishwarya and Apsara's presentation titled '*Analysis of stress-associated transcription factor gene's effects on resistance of Arabidopsis thaliana to Myzus persicae and environmental stresses*', described the utility of controlling transcription factor expression for promoting stress tolerance in plants. This work was conducted in collaboration with Monika Patel, graduate student in Dr. Jyoti Shah's lab. Athulya Nagarajan, Aishwarya Mitra and Apsara Mitra also presented their research at the 2019 Texas Science and Engineering Fair held at the Texas A&M University campus, on March 29-30, 2019. Athulya, Aishwarya and Apsara are Texas Academy of Mathematics and Science (TAMS) students.



Athulya Nagarajan

The following faculty and staff in the Department of Biological Sciences were recognized on March 5, 2019, for their years of service with the University of North Texas: Dr. Jannon Fuchs (30), Kent Chapman (25), Dr. Warren Burggren (20), Dr. Brian Ayre (15), Shanmukh Salimath (10), Dr. Jeff Johnson (10), Martha Frantz (10), Rube Alvarado (5), Gail Shadle (5), Juan Serrani-Yarce (5), Dr. Roisin McGarry (5), Dr. JoAnn Lucero (5), Dr. Chenggang Liu (5), Ipsita Lahiri (5), Ji Hyung Jun (5), Chen man Ha (5), Dr. Lina Gallego-Giraldo (5), Luis Escamilla-Trevino (5), Dr. Benjamin Dubansky (5), Dr. Fang Chen (5), Geoffrey "Lance" Brooks (5), Dr. Jaime Baxter-Slye (5), Dr. Xiaolan Rao (5), and Xirong Xiao (5). They contributed 205 years combined of service to UNT! **Our thanks to all the recipients for their service and dedication to the university. Congratulations to all!**

Dr. Jannon Fuchs

Dr. Warren Burggren

Dr. Xiaolan Rao

Xirong Xiao

Luis Escamilla-Trevino

Faculty and Staff Appointments


Dr. Purnima Neogi

Dr. Purnima Neogi joined the Department of Biological Sciences as Lecturer/Adviser. Dr. Neogi earned her PhD degree in Life Sciences from Devi Ahilya Vishwavidyalay, India, and a MS degree in Genetics and a Bachelors in Education in Biology and Chemistry from Bhopal University, India. She will participate in advising as well as teaching various courses, including Genetics and Biology for Science Majors.

Dr. Christopher Johnston joined the Department of Biological Sciences and the BioDiscovery Institute as a Postdoctoral Research Associate in January 2019. He completed his PhD at the University of Georgia, where his research centered on diurnal effects on herbicide physiology. He currently works in Dr. Ana Alonso's lab, where he is investigating metabolomics and fluxomics in *Physaria fendleri*, an emerging alternative oil crop.


Dr. Christopher Johnston


Emmanuel Ortiz

Emmanuel Ortiz joined the Department of Biological Sciences in January 2019 as the lab manager for Dr. Ana Alonso's Lab. He graduated with a BS in Biology from the University of North Texas, where he worked as an ungraduate research assistant in Dr. Brian Ayre's Lab investigating bast fiber diversity among domestic cotton cultivars. He is currently working with the Alonso lab to understand oil biosynthesis in the emerging crop pennycress (*Thlaspi arvense).*

Student News

University Distinguished Teaching Professor Dr. Lee E. Hughes accompanied students to the Texas Branch- American Society for Microbiology 2019 Spring Meeting held March 28-30, 2019 at the T Bar M Resort and Conference Center in New Braunfels, Texas,

Thesis and Dissertations

Thanasan "Woody" Patcharapinyopong successfully defended his PhD Dissertation "*Antimicrobial and Antiplatelet Activities in the Botanical Extracts Collected from Plants from Northern Thailand*" on March 6, 2019. Dr. Patcharapinyopong's major professor is Dr. Art Goven.


Dr. Thanasan Patcharapinyopon

Jared Williams defended his PhD Dissertation entitled "*American Lawn Addictions: Effects of Environmental Education on Student Preferences for Xeriscaping as an Alternative in North Central Texas, USA*" on March 20, 2019. Dr. Williams' major professor is Dr. Ruthanne Thompson.

Hannah Klug defended her MS thesis entitled "*Comparison and Genetic Analysis of Host Specificity in Cluster BDI Bacteriophages infecting Streptomyces*" on March 22, 2019. Ms. Klug's major professor is Dr. Lee E. Hughes.

Hessah Alzaid defended her MS thesis entitled "*Isolation and Bioinformatic Characterization of Four Novel Bacteriophages from Streptomyces toxytricini*". Ms. Alzaid's major professor is Dr. Lee E. Hughes.

Jindanuch Mandeekul passed her final defense for an MS in Biochemistry and Molecular Biology on March 7, 2019. Ms. Mandeekul's major professor is Dr. Lee E. Hughes.

Usa Suwannasual successfully passed her final defense on February 20, 2019. Dr. Suwannasual's major professor is Dr. Amie Lund.

Extramural Grants and Contracts

Development of resources and tools to improve oil content and quality in pennycress. DOE. PI: Ana Paula Alonso (University of North Texas, $474,390); co-PIs: Grotewold (Michigan State University), Shah (The Ohio State University); $837,154 total funding.

Discovery of novel genes controlling proanthocyanidin (PA) chain length by genome-wide association study (GWAS) in Arabidopsis, University of North Texas College of Science, PI/coPI: Chenggang Liu/ Richard Dixon, $10,000.

Integrated Platform for Measuring Embryonic Physiology. World Precision Instruments, PI: Ben Dubansky (UNT); Co-PI: Warren Burggren (UNT). World Precision Instruments, $50,000. 2/2019-2/2020.

Leverhulme Trust. Living inside a box: performance adaptations in turtles. PI: Jon Codd University of Manchester UK. Co PIs: Dane Crossley, Dr William Sellers. $246,000.

National Science Foundation Collaborative Research: Effect Of Developmental Hypoxia On Juvenile Cardiac Function. PI: Dane Crossely; $775,000 to UNT. Total award $1M. Collaborators Michael Hedrick CSESB, Turk Rhen UND,Todd Gillis Uni Guelph. 2019-2021

Systems approach to understanding and improving industrial oil biosynthesis in an emerging crop *Physaria fendleri*. USDA-NIFA. PI: Ana Alonso. co-PI: Phil Bates (WSU), $198,316 total funding.

The American Alligator: a Comparative Model for Heterotopic Ossification, University of North Texas College of Science, PI: Benjamin Dubansky; CoPI: Dane Crossley. $10,000.

Publications

Aziz, M., Wang, X., Tripathi, A., Bankaitis, V.A., Chapman, K.D. (2019) Structural analysis of a plant fatty acid amide hydrolase provides insights into the evolutionary diversity of bioactive acylethanolamides. Journal of Biological Chemistry (In Press). doi:10.1074/jbc.RA118.006672. http://www.jbc.org/content/early/2019/03/20/jbc.RA118.006672.full.pdf+html

Boukens, B., Tobias, O., Sartori, M.R., Augusto,S.A., Renato, F., Carreira, L.BT., Bjarke, J., Conner, J., Crossley II, D.A., Kristensen.D., (2018) The electrocardiogram of vertebrates: evolutionary changes from ectothermy to endothermy. Progress in Biophysics and Molecular Biology.doi.org/10.1016/j.pbiomolbio.2018.08.005.

Cocuron, J.C., Casas, M.I, Yang, F., Grotewold, E., Alonso, A.P (2019). Beyond the wall: High-throughput quantification of plant soluble and cell-wall bound phenolics by liquid chromatogramhy tandem mass spectrometry. J Chromatogr A. 1589, 93-104. https://www.sciencedirect.com/science/article/pii/S0021967318315796

Cocuron, J-C., Casas, M.I., Yang, F., Grotewold, R., Alonso, A.P. (2018) Beyond the wall: High-throughput quantification of plant soluble and cell-wall bound phenolics by liquid chromatography tandem mass spectrometry. J Chromatogra A. doi: 10.1016/j.chroma.2018.12.059

Conner J., Crossley,J.L., Nelson, D., Elsey, R.M., Wang, T., Crossley II, D.A., (2019). Does the left aorta provide proton-rich blood to the gut when crocodilians digest a meal? J. Exp. Biol. doi: 10.1242/jeb.201079

Gentzel, I.N., Giese, L., Zhao, W., Alonso, A.P., Mackey, D.M. (2019) A simple method for measuring apoplast hydration and collecting apoplast. Plant Physiol. In press (PMID: 30824565) http://www.plantphysiol.org/content/plantphysiol/179/4/1265.full.pdf

Holwerda, E.K., Worthen, R.S., Kothari, N., Lasky, R.C., Davison, B., Fu, C., Wang, Z-Y., Dixon, R.A., Biswal, A.K., Mohnen, D., Nelson, R.S., Baxter, H.L., Mazarei., M., Muchero, W., Tuskan, G.A., Cai, C.M., Gjersing, E., Davis, M.F., Himmel, M.E., Wyman, C.E., Gilna, P., Lynd, L.R. (2019) Multiple levers for overcoming the recalcitrance of lignocellulosic biomass. Biotechnology for Biofuels 12, 15. https://doi.org/10.1186/s13068-019-1353-7.

Joyce, W., Miller, T.E., Elsey, R.M., Wang, T., Crossley II, D.A. (2018) The effects of embryonic hypoxic programming on cardiovascular function and regulation at rest and swimming in American alligators. 188(6) 967-976 Comparative Biochemistry and Physiology A

Kirby, R.A., Cox, G., Nelson, D., Heuer, R., Stieglitz, J., Renetti, D., Grosell, M.,(2019) Acute crude oil exposure alters mitochondrial function at complex III of the electron transport system in cardiac muscle fibers of young adult mahi-mahi (Coryphaena hippurus) to Journal of Comparative Biochemistry and Physiology C. https://doi.org/10.1016/j.cbpc.2019.01.004

Rao, X., Chen, X., Hui Shen, H., Qin Ma, Q., Li, G., Tang, Y., Pena, M.,York, W., Frazier, T., Lenaghan, S., Xiao, X., Chen, F. and Dixon, R.A. (2019) Gene regulatory networks for lignin biosynthesis in switchgrass (*Panicum virgatum*). Plant Biotechnology Journal 17, 580-593.

Sartori,M.R., Kohl, K.F., Taylor, E.W., Abe, A.S., Crossley II, D.A., (2018) Oxygen provision to developing embryos of the snapping turtle Chelydra serpentina. J. Exp. Biol. 221 doi: 10.1242/jeb.185967

Wang, Y., Pasparakis, C., Mager, E., Stieglitz, J., Benetti, D., and Grosell, M. (2019) Ontogeny of urea and ammonia transporters in mahi-mahi (Coryphaena hippurus) early life stages. Comparative Biochemistry and Physiology, Part A. 229: 18–24. https://doi.org/10.1016/j.cbpa.2018.11.018

Seminars/Talks

A Biodesign Strategy for Improving Oil Content in Alternative Crops. Keynote Speaker: Dr. Ana P. Alonso at Ohio State University Plant Sciences Symposium in Columbus, OH, March 30, 2019.

Abietane diterpenoids: A new twist to their function in plants. Invited presentation by Dr. Jyoti Shah at the College of Life Sciences, University of Hyderabad, India. January 17, 2019.

Actin depolymerizing factor 3 and plant defense against insects that feed from the phloem. Invited presentation by Dr. Jyoti Shah at the Center for Cellular and Molecular Biology, Hyderabad, India. January 17, 2019.

Actin depolymerizing factor 3 and plant defense against insects that feed from the phloem. Invited presentation by Dr. Jyoti Shah at the Bose Institute, Kolkata, India. January 19, 2019.

Actin depolymerizing factor 3 and plant defense against insects that feed from the phloem. Invited presentation by Dr. Jyoti Shah at the Texas Agrilife, Dallas, Texas. February 14, 2019.

Development of Resources and Tools to Improve Oil Content and Quality in Pennycress. Genomic Sciences Program Annual PI Meeting. Seminar by Dr. Ana P. Alonso. Co-authors: E. Grotewold and A. Shah. Tyson's Corner, VA, February 24-27, 2019.

Engineering specialized metabolism for plant biomass improvement. Institute of Genetics and Developmental Biology. Invited presentation by Dr. Richard Dixon at the Chinese Academy of Sciences, Beijing, China, March 2019.

Engineering specialized metabolism for plant biomass improvement. Division of Molecular and Cell Biology. Invited presentation by Dr. Richard Dixon at the Hong Kong University, Hong Kong, China, March 2019.

Exploration of Genome Length, Burst Time, and Burst Size of Streptomyces griseus Bacteriophages. Student talk by Jindanuch Maneekul. Co-author Dr. Lee E. Hughes.Texas Branch – American Society for Microbiology 2019 Spring Meeting. New Braunfels, TX, March 29, 2019.

How can Metabolomics and Fluxomics Guide us to Build the Crops of Tomorrow? Invited talk by Dr. Ana Paula Alonso at the University of Georgia, Plant Center 2018 Fall Retreat, Unicoi State Park & Lodge, Helen, GA.

Innovative oil traits and developing soybean germplasm with increased oil while maintaining protein and yield. USB Seed Composition Workshop in St Louis, MO, February 2019. Presentation by Dr. Cintia Arias as part of the collaborative group of Leah McHale from The Ohio State University.

Investigating the natural variation of pennycress metabolome, an emerging crop for aviation biofuel applications. UNT BioDiscovery Institute, Seminar by Dr. Cintia Arias. Co-authors: Tyler Swanson, Fan Yang, Ana Paula Alonso. December 3, 2018.

Structural features and evolution of the NPF family of plant nitrate/peptide transporters. Invited talk by Drs. Alessandra Rogato and Mariella Ferrante at the Institute of Biosciences and Bioresources (IBBR), CNR, Naples, Italy. January 22, 2019.

The BioAnalytical Facility. Seminar by Jean-Christophe Cocuron. Co-author: Ana Paula Alonso at the UNT BioDiscovery Institute, November 12, 2018.

Writing papers for top tier journals in plant biology. Invited talk by Dr. Richard Dixon at the Beijing Forestry University, Beijing, China, March 2019.

Conference Presentations

Arias, C., Moretti, A., Cocuron, J.C., and Alonso, A. *Towards 13C-Metabolic Flux Analysis of developing Thorne Embryos*. Soybean Breeders Workshop, St. Louis, MO. February 11-13, 2019.

Arias, C., Swanson, T., Yang, F., Grotewold, E., Shah, A and Alonso, A. *Investigating the natural variation of pennycress metabolome, an emerging crop for aviation biofuel*. 2019 Genomic Sciences Program Annual PI Meeting, Tyson's Corner, VA. February 24-27, 2019.

Aziz, M., Wang, X., Tripathi, A., Bankaitis, V.A., Chapman, K.D. *Structural insights into the evolutionary divergence of acylethanolamide signaling.* Plant Lipids: Structure, Metabolism, and Function, Gordon Research Seminar, Galveston, TX. January 27-February 1, 2019.

Banda, B., Marshall, M., Nguyen, M., Mariena, K., Tesso, A., Tran, M., Nayek, S., and Hughes, L.E. *Characterization of Streptomyces phage Tom Sawyer and the use of Bioinformatics in Genomic Analysis in Order to Annotate the Genome*. Texas Branch – American Society for Microbiology 2019 Spring Meeting, New Braunfels, TX. March 28-30, 2019.

Cannon, AE, Yan, C. and Chapman, K. N-Acylethanolamine (NAE) *Signaling in Arabidopsis is mediated by NAE- and tissue-specific molecular changes that lead to tissue-specific developmental differences.* Plant Lipids: Structure, Metabolism, and Function, Gordon Research Seminar, Galveston, TX. January 27-February 1, 2019.

Chase, C., Singh, S., Petrie, J., Chapman, K. *Engineered Brassicaceae with Long Chain PUFAs Accumulate Bioactive Endocannabinoids.* Plant Lipids: Structure, Metabolism, and Function, Gordon Research Seminar, Galveston, TX. January 27-February 1, 2019.

Conner, J.L., Elsey, R.M., Crossley II, D.A., *The Effect of Chronic Hypercapnic Incubation on Breathing Patterns in American alligator (Alligator mississippiensis).* The American Physiological Society Intersociety Meeting "Comparative Physiology Integration and Complexity. New Orleans LA.

Crossley, J.L., Smith, B., Stewart, K., Crossley II, D.A., *Experimental examination of predicted cardiac parameters based on ventricle wall thickness in the Northern bobwhite quail, Colinus virginianus.* The American Physiological Society Intersociety Meeting "Comparative Physiology Integration and Complexity. New Orleans LA.

Edward M. Dzialowski, Janna Crossley, Dane A. Crossley III. (2018) Hypoxic incubation has no effect on cardiac muscle mitochondrial oxygen flux or ROS production in the American alligator. The American Physiological Society Intersociety Meeting "Comparative Physiology Integration and Complexity. New Orleans LA.

Filogonio, R., Dubansky, B.H., Crossley II, D.A. *Arterial pressure scaling with body mass in the common snapping turtle, Chelydra serpentina: effects of hypoxia exposure during embryonic development*. FeSBE Sao Paulo, Brazil. 2018

Hanson, J., Theiss, C., Nayek, S., and Hughes, L.E. Annotating Streptomyces phage Araceli. Texas Branch – American Society for Microbiology 2019 Spring Meeting, New Braunfels, TX. March 28-30, 2019.

King, S.D., Schmitt, K., Gray, C.F., Bautista, N.M., Padilla, P.A. *Sphingolipids/Ceramides are Localized to Embryonic P Granules and have a Role in Germline Function in Caenorhabditis elegans.* American Society of Cell Biology and European Molecular Biology Organization International Annual Meeting, San Diego, CA. December 8-12, 2018.

Kirby, A. R., Crossley II, D.A., Mager. E. *Effects of acute and chronic temperature change on the swimming performance and aerobic scope of Sheepshead Minnows (Cyprindon variegatus)* The American Physiological Society Intersociety Meeting "Comparative Physiology Integration and Complexity. New Orleans LA. 2018

Klug, H., Mercado, N., Vasikaran, S., and Hughes, L.E. Comparison and Genetic Analysis of Host Specificity in Cluster BD1 Bacteriophages infecting Streptomyces. Texas Branch – American Society for Microbiology 2019 Spring Meeting, New Braunfels, TX. March 28-30, 2019.

Lamb, R., Bullock, H., Julsaint, S., Mason, B., Pfeiffer, J., Nayek, S., and Hughes, L.E. Annotation and Analysis of Streptomyces phage Tribute. Texas Branch – American Society for Microbiology 2019 Spring Meeting, New Braunfels, TX. March 28-30, 2019.

Lin, K., Mejico, M., Rock, W., Zraiqat, Y., Layton, S., and Hughes, L.E. Exploring the Transfection of Streptomyces Using BryanRecycles Bacteriophage. Texas Branch – American Society for Microbiology 2019 Spring Meeting, New Braunfels, TX. March 28-30, 2019.

Nelson, D., Esbaugh, A., Crossley II, D.A. *Cardiac performance of juvenile red drum (Sciaenops ocellatus) during acute hypoxia and the effect following crude oil exposure.* The American Physiological Society Intersociety Meeting "Comparative Physiology Integration and Complexity. New Orleans LA. *2018*

Salimath, S., Romsdahl, T., Cahoon, E., and Chapman, K. *Localization of vitamin E constituents in transgenic cotton (Gossypium hirsutum L.) embryos.* Beltwide Cotton Conferences, New Orleans, LA. January 8-10, 2019.

Smith, B., Crossley, J.L., Elsey, R.M., Hicks, J.W., Crossley II, D.A. *Developmental oxygen preconditions cardiovascular response to acute hypoxic exposure and maximal beta adrenergic stimulation of anesthetized Juvenile American alligators (Alligator mississippiensis)*. The American Physiological Society Intersociety Meeting "Comparative Physiology Integration and Complexity. New Orleans LA.

Tate, K.B., Eme, J., Crossley, D.A., *The impact of developmental hypoxia on the cardiovascular chemoreflex in embryonic snapping turtles (Chelydra Serpentina)*. The American Physiological Society Intersociety Meeting "Comparative Physiology Integration and Complexity. New Orleans LA.

Whitehead, P., Sturtevant, D., Chapman, K. (2019). *Lipid Droplet Packaging Proteins from jojoba (Simmondsia chinensis)* Plant Lipids: Structure, Metabolism, and Function, Gordon Research Seminar, Galveston, TX. January 27-February 1, 2019.

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