DEPARTMENT OF BIOLOGICAL SCIENCES
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Awards and Recognitions

Congratulations to **Dr. Jannon Fuchs** for reaching the finalist level for the 2022 National CUR-Goldwater Scholars Faculty Mentor Award. Dr. Fuchs was also a finalist for the 2021 award. The CUR-Goldwater Scholars Faculty Mentor Award recognizes faculty mentors who conduct their research in a science, technology, engineering, or mathematics (STEM) discipline, as defined by the Goldwater Scholars program. Mentors must have mentored a minimum of three Goldwater Scholars during their career.

Dr. Jannon Fuchs

Dr. Richard Dixon

Congratulations to **Dr. Richard Dixon** on being awarded the designation of 'Distinguished Research Professor Emeritus' by the Board of Regents at their meeting on November 19, 2021. The University awards the designation of "Emeritus Professor" to recognize individuals who have exhibited outstanding performance during their employment and achieved a high level of professional recognition.

Department of Biological Sciences faculty Drs. Richard Dixon (Emeritus), Jyoti Shah, Warren Burggren, Vladimir Shulaev, Kent Chapman, Guenter Gross (Emeritus) and Thomas Beitinger (retired) were included in the ranking of world's top 2% through their careers of more than six million scientists worldwide within their specialty areas. In addition, Drs. Richard Dixon, Vladimir Shulaev, Jyoti Shah, Warren Burggren, Kent Chapman, Feng Chen and Thomas Beitinger (retired) were included among the top 2% ranking for a single year. The ranking method is based on standardized citation metrics developed by a group of scientists led by John P.A. Ioannidis at Stanford University. The study was published in the *Public Library of Science Biology* journal: "Updated science-wide author databases of standardized citation indicators."

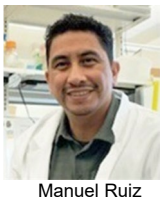
Research Associate Professor **Dr. Marty O'Neill** received a Certificate of Appreciation from the U.S. Army 75th Innovation Command during a recent visit to UNT of a team of ranking officials from the 75th Innovation Command, 1st Innovation Group. At this visit, which was part of a growing effort to support the emerging technology solutions of researchers in the College of Engineering, Lieutenant Colonel Patrick Freshwater presented Dr. O'Neill with the Certificate of Appreciation for his volunteer efforts in educating senior 75th Innovation Command Leadership on the logistics of Operation Warp Speed, a public–private partnership initiated by the United States government to facilitate and accelerate the development, manufacturing, and distribution of COVID-19 vaccines, therapeutics, and diagnostics. Dr. O'Neill and his team developed a cloud-based computer program called RE-PLAN to help state and local public health agencies distribute the COVID-19 vaccine to ensure its timely availability according to each state's guidelines. The program pulls data from a variety of sources to help public health agencies create response plans to use during an epidemic.

Dr. Marty O'Neill

Biology Research in the News

DISCOVERIES NEAR AND FAR. The research of wildlife ecologist and biology professor Dr. Jaime Jiménez spans the globe, from studies of biodiversity on campus to investigations of what drives the distribution of species like the Magellanic woodpecker in Chile. He's also been collaborating with scientists around the world who are researching tardigrades, micro-animals known for their ability to survive in almost any natural environment. That interest stemmed from discoveries Jiménez and his students made on one of their trips funded by an NSF International Research Experience for Students grant. While studying moss dispersal by birds, they found that not only can some moss pass through a bird's digestive tract unharmed, but tardigrades also survive that process. The students have presented results from their research trips in person in the U.S., Mexico, Ecuador, Canada and Denmark. Read the full article and find out more about the research at https://cos.unt.edu/news/unt-professor-and-researcher-dr-jaime-jim%C3%A9nez-makes-discoveries-near-and-far

Dr. Jaime Jiménez



Manuel Ruiz

IMPACTING THE FUTURE OF HUMAN HEALTH. In the laboratory of Dr. Pamela Padilla, biochemistry and molecular biology doctoral student Manuel Axel Ruiz is analyzing the cause and effects of complications that arise in Type 2 Diabetes. His research could potentially identify biomarkers to help doctors with early detection of associated nerve damage. In his free time Ruiz is working on his third master's degree — this one in individualized genomics and health at Johns Hopkins University. A few things he's learned as a student make for good advice outside of academics too: "You have to be resilient and willing to admit there is always something new to learn, even though you are becoming an expert at something," he says. "You also have to learn to listen: to your mentor, to others in the field. Although it sounds easy, at times it can be challenging for some students." Read the full article and find out more about the research at https://cos.unt.edu/news/doctoral-research-spotlight-manuel-axel-ruiz

Faculty and Staff Appointments

Welcome to our new faculty and staff!

Dr. Guadalupe Lopez Puc is a visiting scholar collaborating with Dr. Róisín McGarry for a year-long sabbatical. Dr. Lopez Puc, a Senior Research scientist with the federal Centro de Investigacion y Asistencia en Tecnologia y Diseno del Estado de Jalisco (CIATEJ) in Mérida, Mexico, has expertise in plant biotechnology and the culturing of diverse horticultural and biofuel crops.

Dr. Guadalupe Lopez Puc

Kandice Green

Kandice Green has joined the Biological Sciences Department as the Biology Stockroom Specialist. Kandice had previously served as a campus chemical storeroom coordinator for the South Dakota School of Mines and

Technology for 5 years. In 2019 Kandice moved to Central State University in Ohio where she worked as a lab technician for the department of Agriculture and Life Sciences. During her time at Central State University she worked at building a culture of safety, helped with department IT issues, assisted with new technology training, and running samples on instrumentation. The biggest achievement during her time at Central State University was receiving approval for a chemical inventory management system which has over 3500 chemicals inventoried across campus. Kandice was elected to serve a 3-year term (2021-2023) as secretary on the executive board for the National Association of Scientific Materials Mangers (NAOSMM).

Yingqing Guo joined the BioDiscovery Institute (BDI) in November 2021 as a Research Assistant in Dr. Ana Alonso's Lab. Yingqing is currently working on a project aimed at identifying macrophage molecules consumed by the Histoplasmosis fungus *Histoplasma capsulatum* while it resides within host cells. Yingqing has worked at the Noble Research Institute and Baylor College of Medicine for 15 years before she joined UNT.

Thesis and Dissertation

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


Denice Gallagher


Mehrnaz Moghimi


Danielle Phillippi


Devasantosh Mohanty

Denice Gallagher successfully defended her MS thesis "Correlation of watershed NDVI values to benthic macroinvertebrate biodiversity in eight North American wadeable streams" in December 2021. Professor Dr. Sam Atkinson was her major professor. Deni is currently working as an Administrative Specialist in the Advanced Environmental Research Institute.

Justin Conner successfully defended his PhD dissertation titled "CO_2 transport and acid-base status during fluctuations in metabolic status." Justin's major advisor was Professor Dr. Dane Crossley.

Mehrnaz Moghimi was awarded her MS Degree in Biology. She successfully defended her thesis on October 27, 2021. The title of her thesis is "Influence of hypoxia on acute lead toxicity and calcium homeostasis in early life stage zebrafish (*Danio rerio*)". Mehrnaz's major professor was Assistant Professor Dr. Edward Mager.

Danielle Phillippi successfully defended her dissertation title "Investigating the effects of inhaled diesel exhaust particles on the gut microbiome, intestinal integrity, systemic inflammation, and biomarkers of cardiovascular disease in wildtype mice. Danielle's major professor was Associate Professor Dr. Amie Lund.

Devasantosh (Dev) Mohanty successfully defended his dissertation on November 17th, 2021 as part of the requirement for his Ph.D. degree in Biochemistry and Molecular Biology. The title of his dissertation was "Role of defective in systemic defense induced by abietane diterpenoid 1 (DSA1), a putative o-fucosyltransferase, in plant systemic acquired resistance (SAR)'. Dev's major professor was Distinguished Research Professor Dr. Jyoti Shah. Dev is currently pursuing a postdoctoral position at University of Minnesota.

Garima Saxena defended her PhD thesis "Production and optimization of para-hydroxybenzoic acid (pHBA) in algae using metabolic engineering and genomics approaches" on November 15, 2021. Distinguished Research Professor Dr. Richard Dixon was Garima's dissertation advisor.

Extramural Grants and Contracts

Effects of photobiomodulation on mitochondrial dysfunction in seizures, CENG-COS Collaborative Research Seed Funding. Co-PIs Lin Li (Dept. of Biomedical Engineering) & Jannon L. Fuchs (Dept of Biological Sciences) University of North TX, $10,000.

Population assessment of Smalleye (*Notropis buccula*) and Sharpnose (*Notropis oxyrhynchus*) shiners in the Brazos River and data-driven recommendations for long-term monitoring. Texas Comptroller of Public Accounts. PI: David Hoeinghaus, Co-PIs: Zacchaeus Compson (UNT) and Carmen Montaña (SFA). $499,882; 1/2022-12/2025

Publications

Baylis, K., Lichtenberg. E.M., and Lichtenberg E. (2021) Economics of pollination. Annual Review of Resource Economics 13: 335-354. https://www.annualreviews.org/doi/abs/10.1146/annurev-resource-101420-110406

Destailleur, A., Poucet, T., Cabasson, C., Alonso, A.P., Cocuron, J.-C., Larbat, R., Vercambre, G., Colombié, S., Petriacq, P., Andrieu, M.H., Beauvoit, B., Gibon, Y., and Dieuaide-Noubhani, M. (2021) The evolution of leaf function during development is reflected in profound changes in the metabolic composition of the vacuole. Metabolites 11(12), 848.

Dixon, R.A. (2021). Where are they now? Richard A. Dixon. American Society of Plant Biologists Newsletter 48, 17-18.

Kang, B.-H., Anderson, C.T., Arimura, S., Bayer, E., Bezanilla, M., Botella, M.A., Brandizzi, F., Burch-Smith, T.M., Chapman, K.D., Dünser, K. Gu, Y., Jaillais, Y., Kirchhoff, H., Otegui, M.S., Rosado, A., Tang, Y., Kleine-Vehn J., Wang, P., and Zolman, B.K. (2021) A glossary of plant cell structures: current insights and future questions. The Plant Cell. koab247. https://doi.org/10.1093/plcell/koab247 .

Leal, L., Hoeinghaus, D.J., Compson, Z.G., Agostinho, A.A., Fernandes, R., and Pelicice, F.M. (2021). Changes in the ecosystem functions generated by fish populations after the introduction of a non-native predator (Cichla kelberi). Neotropical Ichthyology, 19: e210041

Schad, A.N., Bellinger, B.J., Dodd, L.L., Kelly, J., Hellinghausen, K., Dick, G.O., and Atkinson, S.F. (2021) Native aquatic plant establishment efforts in a high-herbivore, central Texas reservoir. J. Water Res. Protection. 13: 1024-1042. doi: 10.4236/jwarp.2021.1312055. https://www.scirp.org/journal/journalarticles.aspx?journalid=46

Yadav, U.P., Evers, J.F., Shaikh, M.A., and Ayre B.G. (2021). Cotton phloem loads from the apoplast using a single member of its nine-member sucrose transporter gene family. Journal of Experimental Botany. erab461, https://doi.org/10.1093/jxb/erab461

Oral Presentations

Essential roles for ciliary signaling in neural cell lineages. Invited keynote speaker, Amer. Soc. Biochemistry & Microbiology, Undergraduate Symposium Oct. 8, 2021. Talk by Jannon Fuchs.

Multilevel modeling of lignin biosynthesis in B*rachypodium distachyon*. 5th International Conference on Plant Synthetic Biology, Bioengineering and Biotechnology. American Institute of Chemical Engineers. November 2021 (virtual). Invited seminar by Jaime Barros-Rios.

Properties of astrocyte polarity. Society for Neuroscience, Annual Meeting, November 11, 2021. Talk by David J. Elliott (PhD student). Co-authors: Mekal Mathew (UNT Undergraduate), Geoffrey Zhang (TAMS), Jannon Fuchs.

Receptor regulation in neuronal cilia: Effects of seizures and receptor knockouts. Soc. Neuroscience Annual Mtg, Nov. 9, 2021. Talk by Jessica Shrestha (PhD student). Co-author: Jannon L. Fuchs.

Understanding the biochemical and physiological potential of Pennycress (*Thlaspi arvense* L.). BioDiscovery Institute seminar series, Denton, TX. October 11, 2021. Talk by Dr. Julius Ver Sagun.

Unraveling the Metabolic Pathways Using 13C-Labeling in Developing Siliques of Pennycress. BioDiscovery Institute seminar series, Denton, TX, October 11, 2021. Talk by Dr. Umesh P. Yadav. Co-authors: Trevor B. Romsdahl, Kent D. Chapman, and Ana P. Alonso.

Why do neurons have primary cilia? Invited seminar for Virtual Neuroscience Summit 2021, SelectScience, Oct. 5, 2021. Talk by Jannon Fuchs.

Poster Presentations

Bonatesta, F., Schneider, L., Messerschmidt, V., Lee, J. Lund, A., and Mager, E. (2021) Zebrafish Renal Filtration Integrity Affected by Deepwater Horizon Crude Oil Exposure. Society of Environmental Toxicology and Chemistry, South Central Regional Meeting (virtual).

Emadi, C., Bonatesta, F., and Mager, E. (2021) qPCR Analysis of Hemoglobin Modulation in Response of Co-Exposure to Hypoxia and Lead on Daphnia magna. Society of Environmental Toxicology and Chemistry, South Central Regional Meeting (virtual).

Mittal, I., Alam, S., Chabra, B., Shulaev, E., Mohan, V., Dong, Y., Scofield, S., Rawat, N., Shah, J. Knockdown of Lpx3 function in Wheat Enhances FHB Resistance and Lowers DON Content. 2021 National Fusarium Head Blight Forum, Virtual, Dec 6-7, 2021.

Montoya, Brandon, Mittal, I., Shah, J., Meckes, B. Development of Biocompatible siRNA Nanoparticles to Mitigate FHB in Wheat. 2021 National Fusarium Head Blight Forum, Virtual, Dec 6-7, 2021.

Moore, G.W., Winemiller, K.O., Perkin, J.S., Trungale, J., Hardy, T., Schwalb, A., Hoeinghaus, D.J., Reeves, C., Trimble, A. Environmental flow regimes needed to maintain a sound ecological environment in Texas rivers. American Geophysical Union Fall Meeting, New Orleans, LA and virtual, December 2021

Nair, S., Girija, A., Shah, J. Understanding Plant Defense Responses Towards Aphids. Texas Junior Academy of Science Competition, Virtual, October 14-15, 2021.