DEPARTMENT OF BIOLOGICAL SCIENCES
COLLEGE OF SCIENCE
UNT
EST. 1890

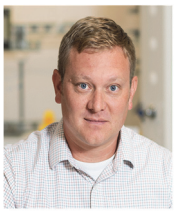
BIOsphere

October 2021 Volume 8; Issue 3

Awards and Recognitions

Dr. Richard Dixon was listed as a 2020 Clarivate™ Web of Science Highly Cited Researcher. The highly anticipated annual list identifies researchers who demonstrated significant influence in their chosen field or fields through the publication of multiple highly cited papers during the last decade. Their names are drawn from the publications that rank in the top 1% by citations for field and publication year in the Web of Science™ citation index.


Dr. Richard Dixon


Dr. Calvin Henard


Dr. Lee Hughes

Dr. Calvin Henard was chosen for a recent publication from his laboratory as a spotlight article of significant interest by the editors of the journal *Applied and Environmental Microbiology* where UNT researcher transforms biogas into sustainable products using bacteria. Read the full article and find out more about the research at https://news.unt.edu/news-releases/unt-researcher-transforms-biogas-sustainable-products-using-bacteria.

Dr. Lee Hughes was selected as an Academic Affairs Fellow in the UNT Office of Faculty Success for the 2021-2022 academic year.

Graduate Awards and Scholarships

BioDiscovery Institute Summer Research Assistantship: Six graduates working on their Ph.D.'s in the BioDiscovery Institute received the BioDiscovery Summer Research Assistantship. Each student gave formal presentations on their research accomplishments made over the Summer.

Biochemical properties of recombinant group I and group II FAAHs from the legume *Medicago truncatula*. BDI Seminar Series (virtual/in-person). September 27, 2021. Talk by Omar Arias Gaguancela (Ph.D. Student-Chapman Laboratory).

Co-expression network analysis identifies hub genes and key pathways associated with the defense response of *Arabidopsis thaliana* to the green peach aphid, Myzus persicae. BDI Seminar Series (virtual/in-person). September 27, 2021. Talk by Jonathan Hernandez (Ph.D. Student-Shah Laboratory).

Bast Fiber Development in *Gossypium hirsutum*. BDI Seminar Series (virtual). September 13, 2021. Talk by Harmanpreet Kaur (Ph.D. Student-Ayre Laboratory).

Prediction of Alzheimer's Disease progression using LSTM. BDI Seminar Series (virtual). September 13, 2021. Talk by Mohammad Al Olaimat (Ph.D. Student-Bozdag Laboratory).

Impact of Fatty Acid Elongase-1 Mutation on Pennycress (*Thlaspi arvense*). BDI Seminar Series (virtual/in-person). September 20, 2021. Talk by Amira Rasoul (Ph.D. Student-Alonso Laboratory).

Lipid Droplet Packaging Proteins from Jojoba (*Simmondsia chinensis*) Improve the Compartmentalization of Wax Esters Produced in Leaves. BDI Seminar Series (virtual/in-person). September 20, 2021. Talk by Payton Whitehead (Ph.D. Student-Chapman Laboratory).

Faculty and Staff Appointments

Dr. Timothy Flewelen has joined the Biological Sciences Department as a Lecturer. Dr. Flewelen is an alumnus of the department, Class of 2006. He received his Ph.D. from the Medical College of Wisconsin in 2012. Prior to coming to the University, he was a Faculty member at Carroll University.


Dr. Timothy Flewelen


Dr. Vanessa Macias


Dr. Angela Stoeckman

Dr. Vanessa Macias has joined the Biological Sciences Department as an Assistant Professor. Dr. Macias grew up in Las Cruces, NM where she started her research training at NMSU as a master's student in a mosquito lab. There she gained an interest in the cellular and genetic mechanics of how mosquitoes can be such potent vectors of human disease. At the University of California, Irvine and at Penn State, Dr. Macias had the opportunity to study under and collaborate with some of the top minds in mosquito genetic engineering and found that there are so many aspects of mosquito and disease biology that are completely unknown. In her new lab, Dr. Macias will pursue discoveries in small RNA biology that will both push the boundary of biotech and in mosquitoes and have impacts on transgenic approaches to disease control.

Dr. Angela Stoeckman is on sabbatical from Bethel University in St. Paul, MN. She is an Associate Professor of Chemistry at Bethel University and has joined the Chapman Lab for the Fall semester. Come by and say hello.

Natasha Gorski has joined the BioDiscovery Institute as a Proposal Manager. In this role, she will help BDI members submit research proposals through editing project narratives, organizing multi-PI submissions, and providing process management support. Natasha joined the University of North Texas in September after spending five years working at a chemical startup in Pittsburgh. She has a background in research, proposal development, and project management, as well as degrees in Biomedical Engineering and Materials Science and Engineering. You can find Natasha in SRB134.


Natasha Gorski


Rusty Hartman


Wendy Fisher

Rusty Hartman has joined the BioAnalytical Facility (BAF) as a Research Assistant. He obtained his Masters in Biomedical Sciences from the University of North Texas Health Science Center at Fort Worth, TX. His thesis research involved understanding the seasonal impact of early life stress on a female mouse model of systemic lupus erythematosus and how this may upregulate heat shock protein 90 thus increasing the prevalence and severity of this disease later in life.

Wendy Fisher has joined the BioDiscovery Institute (BDI) in August 2021 as a Research Assistant and Lab Manager for the Alonso Lab. She is currently working on a project aiming to improve the oil content in pennycress, a promising alternative crop for jet fuel. She obtained a MS in Biomedical Engineering from Wright State University in Dayton, Ohio and has experience in both nanoparticle and shape memory alloy powder production.

Thesis and Dissertation

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

Ann Price successfully defended her dissertation on July 27th, 2021 as part of the requirement for her Ph.D. degree in Biochemistry and Molecular Biology. The title of her dissertation was "Manipulation of Lipid droplet biogenesis for enhanced lipid storage in *Arabidopsis thaliana* AND Nicotiana benthamiana." Ann's major professor was Dr. Kent D. Chapman

Brittany Harried defended her Ph.D. thesis titled "Multiple dimensions of fish functional traits, trait relationships, and associations with community structure and dynamics". Brittany's major professor was Dr. David Hoeinghaus. Brittany is now a Postdoc in Dr. Craig Paukert's lab at the University of Missouri.

Cole Reeves defended his MS thesis titled "Flow-recruitment relationships of Smallmouth Buffalo (*Ictiobus bubalus*) in three Texas river basins". Cole's major professor was Dr. David Hoeinghaus. Cole is now leading field crews working with the National Forest Service in the Sierra National Forest in California.

Stephanie Amack defended her MS thesis titled "Quantifying the effects of single nucleotide changes in the TATA box of the Cauliflower Mosaic Virus 35S promoter on gene expression in *Arabidopsis thaliana*" on July 20th, 2021. Stephanie's advisor was Dr. Mauricio Antunes.


Brittany Harried


Cole Reeves

Extramural Grants and Contracts

Community College Transfer Student Success Initiative (CC TSSI), UNT Team Mentoring Grant, Lisa Welch, Jim Bednarz, Ana Hoeinghaus, Hyunju Kim, Jessica Moore, and Purnima Neogi. Biology Advising Group has received $4,200.

Developing Resistance to Fusarium Head Blight in Wheat. USDA-ARS. PI: Jyoti Shah. $80,256; August 1st, 2021-July 31st, 2022

Spherical nucleic acid nanomaterials as fungicide and FHB resistance-promoting agents. USDA-ARS. PI: Jyoti Shah; Co-PI: Brian Meckes. $41,019; August 1st, 2021-July 31st, 2022

Towards the Development of High-Yielding Cultivars & Germplasm with Optimum Oil and Protein Content and Innovative Oil Attributes for the Current Market. United Soybean Board ($549,773). PI: McHale; Co-PIs: Alonso (UNT $153,682), Chen, Clemente, Mian, Mozzoni

Publications

Arias-Gaguancela and Chapman K.D. (2021) The biosynthesis and roles of N-acylethanolamines in plants. Advances in Botanical Research, in press. https://doi.org/10.1016/bs.abr.2021.07.002

Brejão, G.L., Hoeinghaus, D.J., Roa-Fuentes, C.A., Pérez-Mayorga, M.A., Ferraz, S.F.B., and Casatti, L. (2021) Taxonomic and functional turnover of Amazonian stream fish assemblages is determined by deforestation history and environmental variables at multiple scales. Neotropical Ichthyology, 19: e210042

Ferreira, S.S., and Antunes, M.S. (2021) Re-engineering plant phenylpropanoid metabolism with the aid of synthetic biosensors. Front. Plant Sci. 12: 701385. doi: 10.3389/fpls.2021.701385

Gañan, M., Contador, T., Rendoll, J., Simoes, F., Pérez, C., Graham, G., Castillo, S., Kennedy, J. H., Convey, P. (2021). Records of *Parochlus steinenii* in the Maritime Antarctic and sub-Antarctic regions. Zoology, 1011(1), 63-71. https://zookeys.pensoft.net

Hannappel, M., Chumchal, M. M., Drenner, R W., Kennedy, J. H., Barst, B.D., Catellina, J.M. (2021). Mud Dauber Nests as Sources of Spiders in Mercury Monitoring Studies. Environmental Toxicology and Chemistry, 40(5): 1335-1340.

Hannappel, M. P., Chumchal, M. M., Drenner, R. W., Kennedy, J. H., Barst, B. D., Castellini, J. M., Nolan, A. R., Willoughby, F. M., Trauffler, L. P. (2021). Effect of Body Size on Methyl Mercury Concentrations in Shoreline Spiders: Implications for Their Use as Sentinels. Environmental Toxicology and Chemistry, 40 (4): 1249-1154.

Henard CA, Wu C, Xiong W, Henard JM, Davidheiser-Kroll B, Orata FD, Guarnieri MT. (2021) Ribulose-1,5-Bisphosphate Carboxylase/Oxygenase (RubisCO) Is Essential for Growth of the Methanotroph *Methylococcus capsulatus* Strain Bath. Appl Environ Microbiol. 2021 Aug 26;87(18):e0088121. doi: 10.1128/AEM.00881-21. Epub 2021 Aug 26. *Selected as a spotlight article of significant interest by the AEM editorial board.

Lázaro, X.A., Mackenzie R. & Jiménez J.E. (2021) Evidence of endozoochory in Upland Geese *Chloephaga picta* and White-bellied Seedsnipes *Attagis malouinus* in sub-Antarctic Chile. Ecology & Evolution 11:9191-9197. https://doi.org/10.1002/ece3.7725

Lima Junior, D.P., Bellay, S., Hoeinghaus, D.J., Bini, L.M., Lima, L.B., Yotoko, K., and Agostinho, A.A. (2021) Host diversity, phylogenetic relationships and local environmental factors drive infection patterns of a non-native parasite in tropical floodplain fish assemblages. Hydrobiologia 848: 1041-1057.

López-Malvar A, Malvar RA, Souto XC, Gomez LD, Simister R, Encina A, Barros J, Pereira-Crespo S, Santiago R (2021). Elucidating the Multifunctional Role of the Cell Wall Components in the Maize Exploitation. BMC plant biology doi: 10.1186/s12870-021-03040-3

Malhotra, R., Jiménez J.E. & Harris N.C. (2021) Patch characteristics and domestic dogs differentially affect carnivore space use in fragmented landscapes in southern Chile. Diversity and Distributions. DOI: 10.1111/ddi.13391

Ojeda, V., Schaaf, A., Altamirano, T.A., Bonaparte, B., Bragagnolo, L., Chazarreta, L., Cockle, K., Dias, R., Di Sallo,, F., Ibarra T., Ippi, S., Jauregui, A., Jiménez, J.E., Lammertink, M., López, F., Núñez, M.G., de la Peña, M., Rivera, L., Vivanco, C., Santillán, M., Soto, G.E., Vergara, P., Wynia, A., Politi, N. (2021) Latitude does not influence cavity orientation of South American avian excavators. Ornithology 138:1-14. DOI: 10.1093/ornithology/ukaa064

Perkin, J.S., Papraniku, I.F., Gibbs, W.K., Hoeinghaus, D.J., and Walker, D.M. (2021) Temporal trajectories in metacommunity structure: Insights from interdisciplinary research in intermittent streams. WIREs Water 2021: e1531.

Possamai, B., Hoeinghaus, D.J., and Garcia, A.M. (2021) Shifting baselines: integrating ecological and isotopic time-lags improves trophic position estimates in aquatic consumers. Marine Ecology Progress Series 666: 19-30.

Possamai, B., Hoeinghaus, D.J., and Garcia, A.M. (2021) Environmental factors drive interannual variation in shallow water estuarine food-chain length. Estuarine, Coastal and Shelf Science 252: 107241.

Pyc, M., Gidda, S.K., Seay, D., Esnay, N., Kretzschmar, F.K., Cai, Y., Doner, N.M., Greer, M.S., Hull, J.J., Coulon, D., Bréhélin, C., Yurchenko, O., de Vries, J., Valerius, O., Braus, G.H., Ischebeck, T., Chapman, K.D., Dyer, J.M., Mullen, R.T. (2021) LDIP cooperates with SEIPIN and LDAP to facilitate lipid droplet biogenesis in Arabidopsis. Plant Cell 33(9): 3076–3103. https://doi.org/10.1093/plcell/koab179. Cover image courtesy of Dr. Athanas Guzha.

Villarroel, M., Jiménez, J.E., Mella, J.E., Peñaloza-García, A.P. (2021) The long-tailed chinchilla is not extinct in the north of Chile: a new colony on the coast of Antofagasta region. Mastozología Neotropical 28: 1-7. https://doi.org/10.31687/saremMN.21.28.1.0.32

Vollrath, S.R., Possamai, B., Schneck, F., Hoeinghaus, D.J., Albertoni, E.F., and Garcia, A.M. (2021) Trophic niches and diet shifts of two congeneric mullet species in marine and estuarine habitats. Journal of the Marine Biological Association of the United Kingdom, 101: 431-441.

Xiong W, Kalyuzhnaya MG, Henard CA. (2021) Editorial: Microbial C1 Metabolism and Biotechnology. Front Microbiol. 12: 744030. doi: 10.3389/fmicb.2021.744030.

Yao, T., Feng, K., Xie, M., Barros, J., Tschaplinsk,i T., Tuskan, G.A., Muchero, W., Chen, J.G. (2021) Phylogenetic occurrence of the phenylpropanoid pathway and lignin biosynthesis in plants. Frontiers in Plant Science. doi: 10.3389/fpls.2021.704697

Yu, H., Liu, C. and Dixon, R.A. (2021). A gene-editing/complementation strategy for tissue-specific targeting of lignin reduction while preserving biomass yield. Biotechnology for Biofuels 14, 175 https://doi.org/10.1186/s13068-021-02026-5

Yu, Y.C., Dickstein, R., and Longo, A. (2021) Structural modeling and in planta complementation studies link mutated residues of the Medicago truncatula nitrate transporter NPF1.7 to functionality in root nodules. Front. Plant Sci. 12: 685334. https://doi.org/10.3389/fpls.2021.685334

Oral Presentations

AWARE: Advancing Weeds as Alternative Renewable Energy. BioFrontiers Seminar series, University of North Texas, Denton, TX. September 3rd, 2021. Talk by Ana Paula Alonso.

Barros et al. Modeling lignin biosynthesis using proteomics and isotopic labeling data in *Brachypodium distachyon*. 8th Metabolic Pathway Analyses Meeting (Tennessee, 2021).

Be Creative – Tips for Making Your Own Videos. American Society for Microbiology Conference for Undergraduate Educators (Virtual). Microbrew Presentation. June/July 2021. Dr. Lee E. Hughes.

Carbon dioxide metabolism in the methanotrophic bacterium *Methylococcus capsulatus*. Department of Biological Sciences, University of Texas at Dallas. September 2021. Invited seminar by CA Henard.

Find Your Next Scholarly Project. American Society for Microbiology Conference for Undergraduate Educators (Virtual). July 2021. Panel Roundtable. D. Smyth, Dr. Lee Hughes, N. Boury, N. Broderick, S. Pandey, and T. Muth.

Threshold responses of Amazonian stream fishes to timing and extent of deforestation. Western Division of the American Fisheries Society Annual Conference (virtual). Invited talk by David Hoeinghaus to the organized symposium Effects of Agriculture on Streams. Co-authors: G.L. Brejão, M.A. Pérez-Mayorga, S.F.B. Ferraz and L. Casatti.

Poster Presentations

Arias, C.L., Garcia Navarrete, L.T., Mukundi, E., Swanson, T., Yang, F., Grotewold, E. and Alonso, A.P. Combining transcriptomic and metabolomics approaches to identify targets for pennycress oil improvement. Plant Biology 2021, ASPB 2021 Worldwide summit, Virtual, July 29th-23rd, 2021.

Castro-Moretti, F., Cocuron, J.C., Filho, O.G., Slot., J., Alonso, A.P. Defense-related secondary metabolism is species-specific in Coffea spp. Plant Health 2021, Virtual, August 2nd-6th, 2021

Hannappel, M*., Chumchal, M. M., Drenner, R W., Kennedy, J. H., Barst, and J.M. Castellinid. 2021. Mud Dauber Nests as Sources of Spiders in Mercury Monitoring Studies. 32nd European Congress of Arachnology, 23rd-25th. August 2021. *M. Hannappel was awarded the 1st Place in the Poster competition.

Johnston, C., Ortiz, E., Garcia Navarrete, T., Grotewold, E., and Alonso, A.P. Comparative metabolomics and transcriptomics analysis of high and low-oil pennycress (*Thlaspi arvense* L.) reveals altered pathways and targets for genetic engineering. Plant Biology 2021, ASPB 2021 Worldwide summit, Virtual, July 29th-23rd, 2021.

Mittal, I., Alam, S., Chhabra, B., Shulaev, E., Mohan, V., Rawat, N., and Shah, Targeting Wheat Genes Associated with Susceptibility to *Fusarium graminearum* for Enhancing FHB Resistance. Plant Biology-2021, Annual Meeting of the American Society of Plant Biologists, Virtual, July 19th-23rd, 2021.

Yadav, U.P., Romsdahl, T.B., Grotewold, E., Chapman, K.D. Alonso, A.P. Illuminating Metabolic Pathways Using 13C-labeling in Developing Pennycress Embryos. Plant Biology 2021, ASPB 2021 Worldwide summit, Virtual, July 29th-23rd, 2021.

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

Physical Location
1511 West Sycamore
Life Sciences Complex
Denton, TX 76203-5017, USA

Mailing Address
University of North Texas, Department of Biological Sciences
1155 Union Circle # 305220
Denton, TX 76203-5017, USA

Phone (940) 565-3591
Web: https://biology.unt.edu/

Fax: (940) 565-3821
Facebook: https://www.facebook.com/untbiology