DEPARTMENT OF BIOLOGICAL SCIENCES
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Awards and Recognitions

Dr. Pudur Jagadeeswaran, Professor in the Department of Biological Sciences, was selected University Distinguished Research Professor. University Distinguished Research Professorships recognize tenured faculty holding the rank of Professor who have achieved a truly exceptional record of creative activities or research productivity and who demonstrate a record of continued extraordinary productivity (https://vpaa.unt.edu/fs/recognition/list/research).

Dr. Pudur Jagadeeswaran

Dr. Aaron Roberts

Dr. Aaron Roberts, Professor in the Department of Biological Sciences and Director of Advanced Environmental Research Institute (AERI), is the recipient of the 2021 Division of Research and Innovation's Decker Scholar Award, one of the prestigious Research and Creativity Awards (RCA). This award goes to a faculty member who has been with UNT for at least five years and is in a full-time tenured/tenure-track appointment whose research accomplishments or creative endeavors have been truly outstanding. Elmer Decker, recipient of an honorary Doctor of Science from UNT, established the Decker Scholar Award to recognize outstanding research in the natural sciences, computational sciences, or technology at UNT (https://vpaa.unt.edu/fs/recognition/list/decker).

Dr. Rajeev Azad

Dr. Lee Hughes

Dr. Rajeev Azad, Associate Professor in the Department of Biological Sciences, was selected as the winner of the 2021 Division of Research and Innovation's Early Career Award, one of the prestigious annual Research and Creativity Awards. The Early Career Award goes to a faculty member who has been with UNT for at least five years and is in a full-time tenured/tenure-track appointment with outstanding research accomplishments or creative endeavors (https://vpaa.unt.edu/fs/recognition/list/early-career).

Dr. Lee Hughes, Associate Professor in the Department of Biological Sciences, was reappointed University Distinguished Teaching Professor. University Distinguished Research Professorships recognize faculty at the rank of Professor or Associate Professor who have performed outstanding teaching at the introductory levels of their disciplines, promote continuous development of teaching excellence, and encourage improved teaching among their colleagues in the UNT community (https://vpaa.unt.edu/fs/recognition/list/teaching).

Dr. Jyoti Shah

Dr. Richard Dixon

Dr. Jyoti Shah, University Distinguished Research Professor was selected as the Chair of the Gene Development and Engineering Resistance (GDER) research area of the US Wheat and Barley Scab Initiative (USWBSI; https://scabusa.org/). The USWBSI is a consortium of growers, millers, brewers, other stakeholders and US Department of Agriculture working towards the common mission of enhancing food safety and supply by mitigating the impact of Fusarium Head Blight (scab) disease on wheat and barley, two major crops, worldwide. As the Chair of the GDER, Dr. Shah will be involved in developing the GDER research area priorities and action plan, and reviewing and recommending research proposals for funding. He also represents GDER on the USWBSI steering committee, which is tasked with approving the research priorities, research plans and budget of the several research areas of the USWBSI.

Dr. Richard A. Dixon, University Distinguished Research Professor, was appointed to the Science Advisory Committee of the US Department of Energy Biological and Environmental Science Directorate.

Faculty Appointments

Dr. Zacchaeus Compson

Dr. Zacchaeus Compson joined the Department of Biological Sciences as an Assistant Professor. Dr. Compson obtained his PhD in Biology from Northern Arizona University, where he used isotopically labeled leaf litter to trace carbon and nitrogen through aquatic food webs. He then completed two postdocs in ecoinformatics, one at the Centre for Ecosystem Science and Society (Ecoss) at Northern Arizona University, and a second at the Canadian Rivers Institute (CRI) at the University of New Brunswick. Most recently, he served as the Lead Ecologist at the Centre for Environmental Genomics Applications (CEGA), where he explored ways of rapidly assessing whole-system biodiversity using eDNA metabarcoding. In his lab at UNT (compsonlab.org), Dr. Compson's research team will work on ways of making trait-based food web models using high-resolution data from DNA metabarcoding, and testing these models using isotopic labeling approaches.

Thesis and Dissertation

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

Motamed Qadan successfully defended his PhD dissertation titled "*The development of potential therapeutic anti-myosin s2 peptides that modulate contraction and append to the heart homing adduct "tannic acid" without noticeable effect on their functions*" in March 2021. Motamed's major professor is Dr. Douglas Root, Associate Professor in the Department of Biological Sciences.

Rocio Jara successfully defended her PhD dissertation titled "*Breeding ecology and migratory connectivity of passerines in the world's southernmost forests*" on Feb 24th, 2021. Rocio's major professor is Dr. Jeff Johnson, Associate Professor in the Department of Biological Sciences.

Service Awards

The following faculty and staff were recognized for their combined 130 years of service with the University of North Texas during the (virtual) annual Service Awards event on March 30, 2021. CONGRATULATIONS to all our Service Award honorees!

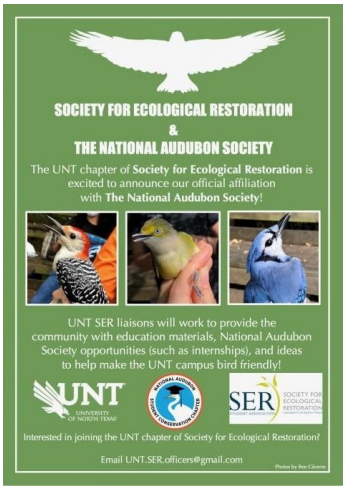
Celebrating 5 years	Celebrating 10 years	Celebrating 15 years	Celebrating 20 years	Celebrating 30 years
Denice Gallagher Crystal Garrett-McEwen Donald “DJ” Lynch	Carol Gagnon Dr. Martin O’Neill Dr. Vladimir Shulaev Elena Shulaev Luhua Song	Dr. Pudur Jagadeeswaran	Dr. Rebecca Dickstein	Dr. Harrell Gill-King

Undergraduate Student News

Texas Academy of Mathematics & Science student **Sai Sarnala** won the 2021 Barry M. Goldwater Scholarship. Over the past two years, Sai worked in Dr. Richard Dixon’s laboratory, firstly performing research under the direct supervision of one of his postdocs, Dr. Ji Hyung Jun, and last year, because of Covid-19 restrictions, working directly with him on a review article. His lab research involved generating and analyzing data for an industry- funded project aimed at engineering chemicals called condensed tannins into forage crops to enhance their nutritive content and reduce methane emissions from cattle and sheep. He worked on checking epidermal-specific promoter activities selected on the basis of RNA sequencing data obtained from dissected Medicago leaf tissues. The review article (Dixon and Sarnala, 2020, Plant Physiology, Published online DOI:10.1104/pp.20.00973) provided an update on current knowledge of condensed tannins, with particular emphasis on their biosynthesis and functions in the plant.

Sai Sarnala

UNT student chapter of the Society for Ecological Restoration (SER) students Bee Caceres, Christine Fox, Victoria Langham, Brandon Meadows, Clarissa Molina, and Brand Richter (pictured left to right) and Dr. Jaime Baxter-Slye are excited to announce the new affiliation of UNT SER with the National Audubon Society "Audubon Campus Program". This means UNT students will receive guidance to promote bird habitat on the UNT campus, get educational, internship, and fellowship opportunity information, and more to give back to UNT SER and the community. The students listed above will serve as “liaisons” for the program for the first year.



Extramural Grants and Contracts

Genetic Manipulation of Cottonseed Protein Reserves. Cotton Incorporated. PI: Kent Chapman $115,000.00

Mapping the pathways leading to industrially relevant fatty acids in *Physaria fendleri*. USDA-AFRI (award #2021-67013-33777). PI: Ana Paula Alonso. $500,000

The Center for Bioenergy Innovation- Lignin Design and Valorization. United States Department of Energy. PI Richard A. Dixon, Co-PI Fang Chen. $587,600

Publications

Adiji, O.A., Docampo-Palacios, M.L., Alvarez-Hernandeza, A., Pasinetti, G.M., Wang, X. and Dixon, R.A. (2021). UGT84F9 is the major flavonoid UDP-glucuronosyltransferase in *Medicago truncatula*. Plant Physiology, https://doi.org/10.1093/plphys/kiab016.

Berstis, L., Elder, T., Dixon, R.A., Crowley, M., Beckham, G.T. (2021) Coupling of flavonoid nucleation sites with monolignols studied by density functional theory. ACS Sustainable Chemistry and Engineering 9, 1518-1528.

Cannon, A.E., Chapman, K.D. (2021). Lipid Signaling through G Proteins. Trends in Plant Science. https://www.sciencedirect.com/science/article/pii/S1360138520303897 doi.org/https://doi.org/10.1016/j.tplants.2020.12.012

Chen, F., Chunliu Zhuo, Z., Xiao, X., Pendergast, T.H., Katrien M,. Devos, KM. (2020) A rapid thioacidolysis method for biomass lignin composition and tricin analysis. Biotechnol Biofuels 14, 18 (2021). https://doi.org/10.1186/s13068-020-01865-y

Liu, C., Yu, H., Rao, X., Li, L., Dixon, R.A. (2021) Abscisic acid regulates secondary cell-wall formation and lignin deposition in *Arabidopsis thaliana* through phosphorylation of NST1. Proceedings of the National Academy of Sciences Feb 2021, 118 (5) e2010911118. https://www.pnas.org/content/118/5/e2010911118

Jarvis, B.A., Romsdahl, T.B., McGinn, M.G., Nazarenus, T.J., Cahoon, E.B,; Chapman, K.D., Sedbrook, J.C. (2021) CRISPR/Cas9-Induced *fad2* and *rod1* Mutations Stacked with *fae1* Confer High Oleic Acid Seed Oil in Pennycress (*Thlaspi arvense* L.). Front. Plant Sci..

https://www.frontiersin.org/articles/10.3389/fpls.2021.652319/abstract

Khan, B.R., Chapman, K.D., Blancaflor, E.B. (2021) Chemical Genetics to Uncover Mechanisms Underlying Lipid-Mediated Signaling Events in Plants. Methods Mol Biol. 22133-16. doi: 10.1007/978-1-0716-0954-5_1. PMID: 33270188.

Lu, N., Rao, X., Li, Y. and Dixon, R.A. (2021). Dissecting the transcriptional regulatory machinery for proanthocyanidin and anthocyanin biosynthesis in soybean. Plant Biotechnology Journal, March 2021, https://doi.org/10.1111/pbi.13562

Romsdahl, T.B., Kambhampati, S., Koley, S., Yadav, U.P., Alonso, A.P., Allen, D.K., Chapman, K.D. (2021) Analyzing Mass Spectrometry Imaging Data of 13C-labeled Phospholipids in *Camelina sativa* and *Thlaspi arvense* (Pennycress) Embryos. Metabolites, 11(3), 148. doi: 10.3390/metabo11030148.

Salimath, S.S., Romsdahl, T.B., Konda, A.R, Zhang, W., Cahoon, E.B., Dowd, M.K., Wedegaertner, T.C., Hake, K.D., and Chapman, K.D. (2021) Production of tocotrienols in seeds of cotton (*Gossypium hirsutum* L.) enhances oxidative stability and offers nutraceutical potential. Plant Biotechnology Journal (2021), pp. 1–15. https://doi.org/10.1111/pbi.13557

Serrani-Yarce, J.C., Barros-Rios, J., Escamilla-Trevino, L.L., Gallego-Giraldo, L., Pu, Y., Ragauskas, A. and Dixon, R.A. (2021). Targeting hydroxycinnamoyl CoA: shikimate hydroxycinnamoyl transferase for lignin modification in *Brachypodium distachyon*. Biotechnology for Biofuels 14, 50 (2021). https://doi.org/10.1186/s13068-021-01905-1

Poster Presentations

Archer, L., Mondal, H.A., Louis, J., and Shah, J. Characterization of the Actin depolymerization factor 3-dependent mechanism in defense against the green peach aphid, Myzus persicae. BDI- External Advisory Board Meeting (virtual), March 4-5, 2021.

Arias, C.L., Moretti, A., Quach, T., Nguyen, H., Guo, M., Clemente, T. and Alonso, A.P. Overexpression of Arabidopsis Wri1 and DGAT1 during soybean embryo development alters oil composition and starch metabolism BDI- External Advisory Board Meeting (virtual), March 4-5, 2021.

Girija, A., Louis, J., Mohanty, D., Mondal, H.A., Shah, S., Yang, E., and Shah, J. PCB1, a PAD4-regulated membrane-localized, calcium-binding protein encoding gene modulates green peach aphid resistance in Arabidopsis. BDI- External Advisory Board Meeting (virtual), March 4-5, 2021.

Johnston, C., Ortiz, E., Yang, F., Arias, C., Garcia-Navarrete, L.T., Grotewold, E., Alonso, A.P. Comparative metabolomics and transcriptomics analysis reveals biochemical mechanisms associated with high and low oil phenotypes of pennycress (*Thlaspi arvense* L.). BDI- External Advisory Board Meeting (virtual), March 4-5, 2021.

Mittal, I., Alam, S., Chhabra, B., Shulaev, E., Mohan, V., Rawat, N., and Shah, J. Targeting wheat genes associated with susceptibility to Fusarium graminearum for enhancing FHB resistance. BDI- External Advisory Board Meeting (virtual), March 4-5, 2021.

Mohanty, D., Chowdhury, Z., Venables, B., and Shah, J. Understanding the role of DAR1, a putative O-fucosyl transferase, in plant systemic immunity. BDI-External Advisory Board Meeting (virtual), March 4-5, 2021.

Sagun, J.V., Guzha, A., Arias, C., Garcia, T., Barbaglia, A., Grotewold, E., Chapman, K.D., and Alonso, A.P. Unravelling the role of pennycress (*Thlaspi arvense* L.) proteins in the modulation of neutral lipid droplet abundance. 2021 Genomic Sciences Program Annual PI Meeting (virtual), February 22-24, 2021.

Sagun, J.V., Guzha, A., Arias, C., Garcia, T., Barbaglia, A., Grotewold, E., Chapman, K.D., and Alonso, A.P. Unravelling the role of pennycress (*Thlaspi arvense* L.) proteins in the modulation of neutral lipid droplet abundance. BDI- External Advisory Board Meeting (virtual), March 4-5, 2021.

Twayana, M.L., Mondal, H., and Shah, J. Role of a putative immune receptor in plant defense against the green peach aphid. BDI- External Advisory Board Meeting (virtual), March 4-5, 2021.

Yadav, U.P., Romsdahl, T.B., Ortiz, E., Grotewold, E., Chapman, K.D. Alonso, A.P. Elucidating the Temporal and Spatial Organization of Storage Lipids using ^{13}C-labeling in Developing Embryos of pennycress, a Promising Source for Aviation Fuel. Biological and Environmental Research (BER), 2021 Genomic Sciences Program Annual PI Meeting (virtual), February 22-24, 2021.

Yadav, U.P., Romsdahl, T.B., Ortiz, E., Grotewold, E., Chapman, K.D. Alonso, A.P. Tracing Metabolic Pathways Using ^{13}C-labeling in Developing Pennycress Embryos. BDI- External Advisory Board Meeting (virtual), March 4-5, 2021.

Oral Presentations

Combining in silico modeling and in planta complementation in the model legume plant Medicago truncatula to understand nitrate transport mechanisms by MtNPF1.7. Invited talk by Dr. Gustavo Salazar at the Department of Chemistry and Biochemistry, Texas Woman's University, Denton, Texas. March 26th, 2021

Towards the development of high-yielding cultivars & germplasm with optimum oil and protein content and innovative oil attributes for the current market. Soybean Seed Composition Workshop, St Louis, MO, USA, February 24-25. Invited virtual seminar by Dr. Leah McHale. Co-authors: A.P. Alonso, T. Clemente, P. Chen, R. Mian, L. Mozzoni

Understanding the role of DAR1, a putative O-fucosyl transferase, in plant systemic immunity. BDI Seminar, Denton, TX (virtual), March 15, 2021. Talk by Devasantosh Mohanty (Ph.D. Student). Co-authors: Z. Chowdhury, and J. Shah.

Visualizing Seed Lipidomes: Unexpected Lessons in Biochemical Heterogeneity. School of Biosciences, Cardiff University -- Joint Biomedicine and Molecular Biology Division Seminar Series. March 16, 2021. Invited seminar given by Kent D. Chapman via videoconference.

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