



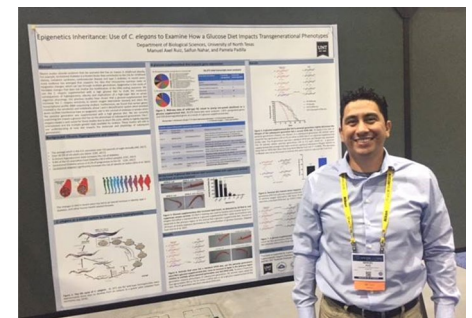
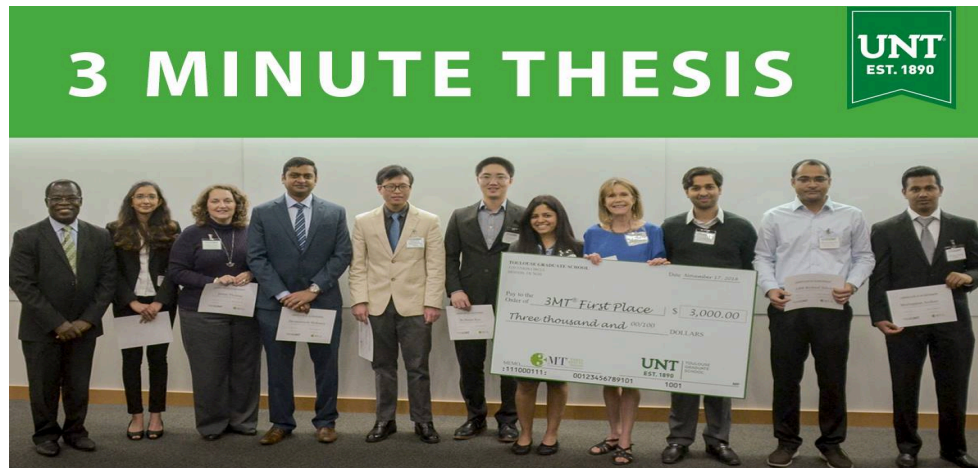
## Awards and Recognition

University Distinguished Research Professor **Dr. Richard Dixon** was honored with the UNT President's Citation and the Texas Governor's Commendation following his election to the Royal Society.

**Sujata Agarwal** and **Devasantosh Mohanty**, graduate students in the labs of **Drs. Pamela Padilla** and **Jyoti Shah**, respectively, were finalists at UNT's 3MT<sup>®</sup> Competition for students pursuing a PhD degree. This 3 Minute Thesis competition challenges students to consolidate their ideas and research discoveries so they can be presented concisely to a non-specialist audience in 3 minutes. In her presentation "*Treat Diabetes with Sunshine*", Sujata discussed her discoveries on the impact of vitamin D on controlling diabetes. **Devasantosh (Dev) Mohanty's** presentation "*Immunized Plants: An Answer to Global Hunger*" highlighted his work on a plant-derived diterpenoid that functions as an immune booster to protect plants against a broad-spectrum of diseases. Dev's presentation won the People's Choice Award, which included a \$1,000 cash prize.



Dr. Richard Dixon



Manuel Ruiz

**Manuel Ruiz**, graduate student in Dr. Pamela Padilla's lab won \$1,000 for 2<sup>nd</sup> Place finish for a Poster Presentation at the American Cell Biology Conference in San Diego, CA. December 7-12, 2018.

## New Faculty

**Dr. Mauricio Antunes** joined the Department of Biological Sciences and the BioDiscovery Institute as an Assistant Professor in September 2018. Dr. Antunes' research centers around the development and application of tools from the emerging field of synthetic biology to engineer plants with novel traits that function in a predictable and tunable manner to improve bio-productivity.

**Dr. Ana Paula Hoeinghaus** joined the Department of Biological Sciences in September 2018 as a Lecturer cum advisor. She completed her PhD in Biology from the University of North Texas. Dr. Hoeinghaus' research examined thresholds and legacy effects of floodplain fish assemblages in response to hydrological variability. Dr. Hoeinghaus currently teaches Biodiversity and Animals Environmental Science. Dr. Hoeinghaus brings her teaching and research expertise to the position of Advisor/Lecturer in Ecology and Environmental Science here at UNT.



Dr. Mauricio  
Antunes



Dr. Ana P.  
Hoeinghaus

**Dr. Jessica Moore** joined the Department of Biological Sciences in September 2018 as a Lecturer cum advisor. She received her PhD in Biology from University of Texas-Austin where she worked on gene regulation in *Drosophila*. Dr. Moore completed post doc tenures at Rutgers University and Jake Gittlen Cancer Research Institute at Penn State College of Medicine, where she supervised a medium-scale zebrafish mutagenesis project, to identify novel cancer genes. Dr. Moore brings her teaching and research expertise to the position of Advisor/Lecturer in Genetics, Cell Biology and Molecular Biology here at UNT.

## News

University Distinguished Research Professor **Dr. Jyoti Shah** was appointed Interim-Chair of the Department. Dr. Shah took over the reins of the department on September 1, 2018 from **Dr. Art Goven** who admirably served the department, the college and the university in an administrative role for over 12 years. Thank you Dr. Goven for your service to UNT.



Dr. Jyoti Shah

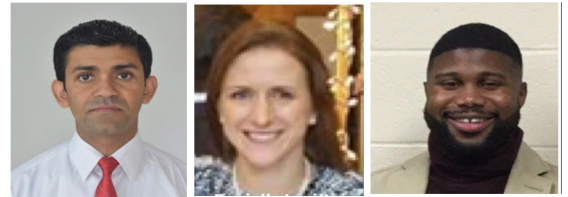
Dr. Art Goven

## Thesis and Dissertations

**Andrea Venable** successfully defended her PhD dissertation in Biology. Her major professor is Dr. Brian McFarlin, Professor in the Department of Kinesiology, Health Promotion, and Recreation, and the Department of Biological Sciences. The title of her dissertation was "*Implications of Diet in Cardiovascular Disease Risk: Postprandial Changes in Circulating Monocytes and Endotoxemia*".

**Ashok Subedi** successfully defended his PhD in Biology. His major professor is Dr. Jannon Fuchs, Professor in Biological Sciences. The title of his dissertation was "*The Role of Primary Cilia in the Oligodendrocyte Lineage*".

**Clinton Onyemaechi** successfully defended his MS thesis in Biology. His major professor is Associate Professor Dr. Dane Crossley. The title of his thesis was "*Autonomic Nerve Activity and Cardiovascular Function in the Chicken Embryo (Gallus Gallus)*".



Dr. Ashok Subedi

Dr. Danielle Levitt

Clinton Onyemaechi

**Danielle Levitt** successfully defended her PhD in Biology. Her major professor is Dr. Jakob Vingren, Professor in the Department of Kinesiology, Health Promotion, and Recreation, and the Department of Biological Sciences. The title of her dissertation was "*Resistance Exercise and Alcohol: Combined Effects on Physiology and Performance*".

**Emma Barnes** successfully defended her MS thesis in Environmental Science. Her major professor is Dr. Aaron Roberts, Professor in Biological Sciences. The title of her thesis was "*Producing a film on oil spill research for the public*".

**Griffith Davis** successfully defended his PhD dissertation in Biology. His major professor is Dr. Amie Lund, Assistant Professor in Biological Sciences. The title of his dissertation was "*Exposure to Nanomaterials Results in Upregulation of Inflammatory and Atherosclerotic Signaling Pathways in the Vasculature*".

**Jason Magnuson** successfully defended his PhD in Biology. His major professor is Dr. Aaron Roberts, Professor in Biological Sciences. The title of his dissertation was "*Effects of Deepwater Horizon Crude Oil on Visual Function in Telosts*".

**Richard Hale** successfully defended his PhD dissertation in the area of Biochemistry and Molecular Biology. His major professor is University Distinguished Teaching Professor Dr. Lee Hughes. The title of his dissertation was "*Isolation and Genomic Characterization of 45 Novel Bacteriophages Infecting the Soil Bacterium *Streptomyces griseus**".

## Extramural Grants and Contracts

*Developing and characterizing soybean cultivars with increased oil while maintaining protein and yield.* SmithBucklin. Co-PI: Ana Paula Alonso (University of North Texas, \$126,320); PI: McHale (The Ohio State University); other co-PIs: Bacon (University of Arkansas), Chen (Missouri University), Clemente (University of Nebraska-Lincoln), Mian (USDA-ARS); \$483,451 total funding.

*Transforming row crops to express condensed tannins.* Grasslanz Technology Ltd, New Zealand. PI: Dr. Richard A. Dixon. \$120,000.

*Environmental flow regime assessment and development of a monitoring framework.* Texas Water Development Board. Co-PI: David Hoeinghaus; PI: Winemiller (TAMU) and other Co-PIs Perkin and Moore (TAMU), Hardy and Schwalb (TX State), Trungale (Trungale Engineering & Science), Buzan (Freese & Nichols, Inc.); \$240,000

*Plant enzyme structure, design and engineering toward synthesis of bio-based products.* Conagen Inc. PI: Xiaoqiang Wang, \$17,000.

*Engineering Seed Value in Cotton - Strategies to Modify Seed Quality.* Cotton Incorporated. PI: Kent D. Chapman. \$55,000.

*RNA-Interference Targeting of Fungal Genes for Enhancing FHB Resistance.* US Department of Agriculture PI: Jyoti Shah. \$35,486.

*Wheat Variants Deficient in a FHB Susceptibility Factor.* US Department of Agriculture PI: Jyoti Shah. Co-PI: Nidhi Rawat (Univ. Maryland). \$54,000.

## Recent Publications

Ban, Z., Mitchell, A.J., Liu, B., Qin, H., Zhang, F., Weng, J.-k., Dixon, R.A. and Wang, G. (2018). Identification of two non-catalytic chalcone isomerase-fold proteins for prenylchalcone production in *Humulus lupulus* reveals auxiliary components in flavonoid biosynthesis. *Proceedings of the National Academy of Sciences USA* 115, E5223-E5232.

Bhattarai, K., Shanmugam Rajasekar, S., Dixon, R.A. and Monteros, M.J. (2018). Agronomic performance and lignin content of HCT down-regulated alfalfa (*Medicago sativa* L.). *Bioenergy Research* 11, 505-515.

Beckham, G.T., Meek, K., Reed, M.L., Katahira, R., Stone, M.L., Anderson, E.M., Chen, F., Dixon, R.A., Roman-Leshkov, Y. (2018) Reductive Catalytic Fractionation of C-Lignin. *ACS Sustainable Chemistry & Engineering*. 6(9):11211-11218.

Faraji, M., Fonseca, L.L., Escamilla-Treviño, L., Barros-Rios, J., Engle, N., Yang, Z.K., Tschaplinski, T.J., Dixon, R.A. and Voit, E.O. (2018). A dynamic model of lignin biosynthesis in *Brachypodium distachyon*. *Biotechnology for Biofuels* 11, 253. <https://doi.org/10.1186/s13068-018-1241-6>.

Li X., Teitgen A.M., Shirani A., Ling J., Busta L., Cahoon R.E., Zhang W., Li Z., Chapman K.D., Berman D., Zhang C., Minto R.E., Cahoon E.B. (2018) Discontinuous fatty acid elongation yields hydroxylated seed oil with improved function. *Nature Plants* 4: 711–720.

Li, Y., Shuai, L., Kim, H., Motagamwala, A.H., Mobley, J.K., Yue, F., Yuki Tobimatsu, Y., Havkin-Frenkel, D., Chen, F., Dixon, R.A., Luterbacher, J.S., Dumesic, J.A. and Ralph, J. (2018). An “Ideal lignin” facilitates full biomass utilization. *Science Advances* 4, DOI: 10.1126/sciadv.aau2968.

Liu, W., Mazarei, M., Ye, R., Peng, Y., Shao, Y., Baxter, H.L., Sykes, R.W., Turner, G.B., Davis, M.F., Wang, Z.-Y., Dixon, R.A. and Stewart, Jr, C.N. (2018). Switchgrass (*Panicum virgatum* L.) promoters for green tissue-specific expression of the MYB4 transcription factor for reduced-recalcitrance transgenic switchgrass. *Biotechnology for Biofuels* 11, 122. doi.org/10.1186/s13068-018-1119-7.

Longo, A., Miles, C., Dickstein, R. (2018) Genome Mining of Plant NPFs Reveals Varying Conservation of Signature Motifs Associated with the Mechanism of Transport. *Front. Plant Sci* | <https://doi.org/10.3389/fpls.2018.01668>.

Muchero, W., Bryan, A.C., Chen, J.-G., Guo, H.-B., Tschaplinski, T., Singan, V.R., Lindquist, E., Payyavula, R.S., Barros-Rios, J., Dixon, R.A., Engle, N., Yee, K., Sykes, R.W., Jawdy, S., Gunter, L.E., Thompson, O., DiFazio, S.P., Evans, L.M., Winkler, K., Collins, C., Schmutz, J., Guo, H., Kalluri, U., Rodriguez, M., Feng, K., Xie, M., and Tuskan, G.A. (2018). A 5-enolpyruvylshikimate-3-phosphate synthase-like gene is a transcriptional regulator of phenylpropanoid and flavonoid pathways. *Plant Cell* 30(7): tpc.00168.2018. 10.1105/tpc.18.00168.

Montag, L.F.A., Winemiller, K.O., Keppeler, F.W., Leão, H., Benone, N.L., Torres, N.R., Prudente, B.S., Begot, T.O., Bower, L.M., Saenz, D.E., Lopez-Delgado, E.O., Morales, Y.Q., Hoeninghaus, D.J., and Juen, L. 2018. Land cover, riparian zones and instream habitat influence stream fish assemblages in the eastern Amazon. *Ecology of Freshwater Fish* DOI: 10.1111/eff.12455.

Nalam, V., Louis, J., Patel, M., Shah, J. (2018). Arabidopsis-green Peach Aphid Interaction: Rearing the Insect, No-choice and Fecundity Assays, and Electrical Penetration Graph Technique to Study Insect Feeding Behavior. *Bio-Protocol*, 8(15), 1-24. [www.bio-protocol.org/e2950](http://www.bio-protocol.org/e2950).

Prewitt, S.F., Ayre, B.G., and McGarry, R.C. (2018) Cotton CENTRORADIALIS / TERMINAL FLOWER 1 / SELF-PRUNING genes functionally diverged to differentially impact plant architecture. *Journal of Experimental Botany*. <https://doi.org/10.1093/jxb/ery324>.

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. (2018). Gene regulatory networks for lignin biosynthesis in switchgrass (*Panicum virgatum*). *Plant Biotechnology Journal*, doi-10.1111/pbi.13000.

Temple, S., Jaime Barros-Rios, J. and Dixon, R.A. (2018). Lignin engineering in forage crops. *Current Opinion in Biotechnology* 56, 48-54.

Yanding Li, Li Shuai, Hoon Kim, Ali Hussain Motagamwala, Justin K. Mobley, Fengxia Yue, Yuki Tobimatsu, Daphna Havkin-Frenkel, Fang Chen, Richard A. Dixon, Jeremy S. Luterbacher, James A. Dumesic and John Ralph (2018) An “ideal lignin” facilitates full biomass utilization. *Science Advances* 4: eaau2968.

## Book Published

*Development and Environment*. Editors: Warren Burggren and Benjamin Dubansky. Springer ISBN-13: 978-3319759333 or ISBN-10:3319759337 (2018)

## Seminars/Talks

*A putative resistance gene RESISTANCE TO Myzus persicae (RMP) is required for the plant defense against the green peach aphid*. Oral Presentation by Moon Twayana at Botany 2018, Rochester, Minnesota, United States of America. Co-authors: Hossain Mondal and Jyoti Shah

*Actin cytoskeleton dynamics and plant defense against insects that feed from the phloem*. UNT BioDiscovery Institute -seminar, Sept 17, 2018. Talk by Dr. Jyoti Shah.



*Active Learning Across an Entire Microbiology Course: A View from the Trenches.* American Society for Microbiology Conference for Undergraduate Educators, Austin, TX, July 27, 2018. Invited talk by Dr. Lee Hughes.

*Differential lignin modification reveals diversity of cell wall-derived signals for activation of defense responses.* Joint International Symposium of the Beijing Advanced Innovation Center for Tree Breeding by Molecular Design and the Umea Plant Science Center, Beijing Forestry University, Beijing, China, August 27, 2018. Talk by Dr. Richard A. Dixon.

*Do we know all the players in monoglignol biosynthesis?* Lignin Gordon Research Conference, Stonehill College MA, August 6, 2018. Talk by Dr. Richard A. Dixon

*Dynamic landscapes and stream fish ecology in the Neotropics: Lessons from and for temperate systems.* American Fisheries Society Annual Meeting; Atlantic City, New Jersey. August 2018. Invited talk by Dr. David Hoeinghaus in the symposium Advances in understanding landscape influences on freshwater habitats and biological assemblages. Authors: Zeni, J.O., Brejão, G., Casatti, L., Montag, L.F.A., Driver, L.J., and Infante, D.

*Imaging and High-Resolution Analysis of Plant Lipids: a tool for probing lipid metabolism.* 23rd International Symposium on Plant Lipids Yokohama Japan, July 9, 2018. Special Invited Lecture: Recent Advances in Imaging of Plant Lipids by Dr. Kent Chapman.

*Invited Guest University Lecturer- Undergraduate Cell Biology,* Huazhong Agricultural University, Wuhan, China, August 12-16, 2018. 21 students, 16h lectures, 1 university credit, Lectures, Homework assignments and exams given by Dr. Kent Chapman and assisted by Dr. Shaoping Lu. Hosted by Dr. Liang Guo, College of Plant Sciences, HZAU, Wuhan.

*New players in Lipid Droplet Biology.* 14<sup>th</sup> GERLI-Lipidomics Meeting, St. Maximin, France, Sept 30- October 4, 2018, Invited Symposium Speaker, Dr. Kent Chapman.

*Plant-aphid Interaction: A Tug-O-War for Supremacy.* University of Nebraska Department of Entomology and Center for Biotechnology, Lincoln, NE, Sept 19, 2018. Talk by Dr. Jyoti Shah.

*Rapid accretion of brain DHA in an altricial bird due to its aquatic-based maternal diet.* 27<sup>th</sup> International Ornithological Congress, Vancouver, British Columbia, Canada, August 19-26, 2018. Presentation by Dr. Edwin Price. Co-authors, S. Sirsat, T. Sirsat, B. Venables, and E. Dzialowski.

*Regulation of Lipid Droplet Accumulation in Plant Tissues--New Protein Players in Plant Lipid Droplet Biology.* Noble Research Institute, Ardmore, OK, September 13, 2018. Invited seminar by Dr. Kent Chapman.

*Structure and engineering of plant UGTs toward drug development and metabolism.* 5<sup>th</sup> International Conference on Glycobiology and Glycoproteomics, Toronto, Canada, August 27, 2018. Talk by Dr. Xiaoqiang Wang

*Structural Insights into the Evolutionary Divergence of Acylethanolamide Signaling.* Purdue University, Biochemistry Department Seminar Series, West Lafayette, IN, September 18, 2018. Invited seminar by Dr. Kent Chapman.

*Understanding and manipulating plant specialized metabolism.* New Fellows Seminar, The Royal Society, London, UK. July 11, 2018. Talk by Dr. Richard Dixon

## Conference Presentations

Chen, F., Wang, X., Xiao, X., and Dixon, R. (2018) *X-lignin challenge: lignification with alternative lignin monomers.* Lignin Gordon Research Conference, August 5 - 10, 2018, Easton, MA, US

Chen, F., Wang, X., Xiao, X., and Dixon, R. (2018) *Lignin with alternative lignin monomers.* CBI Annual Meeting, June 5-10, 2018. Asheville, North Carolina

Jara, R.F., Crego, R.D., Arellano, F.J., Altamirano, T.A., Ibarra, J.T., Rozzi, R., and Jiménez, J.E. (2018). *Breeding strategies of passerines in the world's southernmost forests.* 27<sup>th</sup> International Ornithological Congress, Vancouver, British Columbia, Canada.

Harried, B.L., Daugherty, D.J., Neeley, D., Sutton, T.M., Soulen, B.K., Kim, D., Melton, A., Rubiano, M., Roberts, A.P., and Hoeinghaus, D.J. *Mercury body burden and maternal transfer, egg quality and fecundity of Alligator Gar in the Lower Trinity River: Are bigger fish always better for recruitment?* American Fisheries Society Annual Meeting; Atlantic City, New Jersey. August 2018.

Keener, A. Varughese, E.W.D., Mazur-Mosiewicz, A. Crawford, J., Farabough, M.C., & Ford, A. (2017, August). *Fail rates and their correlates in Victoria Symptom Validity Test: Systematized Search and Literature Review.* Poster session presented at the 125th American Psychological Association Annual Convention, Washington, DC.

Mohanty, D., Chowdhury, Z., Venables, B. J., and Shah, J. *Understanding the role of DAR1, a putative O-fucosyl transferase in plant systemic immunity and flowering time.* Plant Biology 2018, the annual meeting of the American Society of Plant Biologists, United States of America. 2018.

Novaes, J.L., Peretti, D., Costa, R., and Hoeinghaus, D.J. Longitudinal gradients in the fish assemblages of small reservoirs in intermittent river basins of the Brazilian semiarid region. Joint Meeting of Ichthyologists and Herpetologists; Rochester, New York. July 2018.

Shaikh, M.A., Yadav, U.P., Evers, J.F., and Ayre, B.G. (2018) *Functional and molecular characterization of sucrose transporters in cotton (Gossypium hirsutum)*. Plant Biology 2018, Annual Meeting of the American Society of Plant Biologists, Montreal, Quebec, Canada, July 14-18.

Varughese, E., Chapman, W.D., Mazur-Mosiewicz, A., Crawford, J.H., Farabough, M.C., & Ford, A. (2017, August). *Pediatric Pass Rates in the Test of Memory Malingering: Systematic Search and Review*. Poster session presented at the 125th American Psychological Association Annual Convention, Washington, DC.

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