



Awards and Recognitions

Distinguished Research Professor **Dr. Richard Dixon** and Professors **Dr. Ron Mittler** and **Dr. Vladimir Shulaev** were named as Thompson Reuters 2015 Highly Cited Researchers in the category of Plant and Animal Sciences, and recognized as the 2015 World's Most Influential Scientific Minds. <http://hcr.stateofinnovation.thomsonreuters.com/>



Drs. Richard Dixon, Vladimir Shulaev and Ron Mittler



Arjun Yagnamurthy

Kudos to **Arjun Yagnamurthy**, junior at the Texas Academy of Mathematics and Sciences, and **Ethan Patel**, senior at the North Hills Preparatory School in Irving (TX) whose research project '*Dehydroabietinal signaling gene in plant defense and transition to flowering*' was recognized as a semifinalist at the 2015 Siemens Math, Science and Technology Competition. Arjun and Ethan worked with Biological Sciences graduate student Zulkarnain Chowdhury, with Distinguished Research Professor Jyoti Shah, as their research mentor.

Promotion and Tenure

Congratulations to **Dr. Roisin McGarry** on her promotion to the rank of **Research Assistant Professor**. Dr. McGarry is using virus-based gene-manipulation technologies to understand plant architecture and distribution of vegetative and reproductive growth, principally in cotton plants.



Dr. Roisin McGarry

Other News

In October 2015, the **BioDiscovery Institute** (BDI; <https://research.unt.edu/institutes/bdi>) and the **Advanced Environmental Research Institute** (AERI; <https://research.unt.edu/institutes/aeri>) were launched by UNT as institutes of research excellence. Dr. Richard Dixon, Distinguished Research Professor in Biology, and Dr. Samuel Atkinson, Regents Professor in Biology, are the founding Directors of BDI and AERI, respectively. The mission of BDI (<https://research.unt.edu/institutes/bdi>) is to leverage existing UNT strengths while identifying opportunities to play a national and international leadership role in the basic understanding of plant processes and materials for the development of a sustainable and environmentally friendly bio-based economy. The mission of AERI (<https://research.unt.edu/institutes/aeri>) is to foster, facilitate and conduct science-based interdisciplinary environmental research that provides an understanding of how human actions impact the environment, and then use that knowledge to suggest scientific, engineering, policy and/or educational solutions to actual environmental problems.

UNT Biological Sciences alumnus **Dr. Abduraham Adnan Niazy** (Ph.D. 2014) has been appointed a Research Specialist at King Saudi University Medical Research Center in Saudi Arabia. Dr. Lee Hughes, Associate Professor in Biological Sciences, was Dr. Niazy's PhD mentor.

UNT Biological Sciences alumnus **David Baxter** took a position with Next Health (Dallas). His new title is "Certifying Scientist". David oversees the quality of LCMS analyses for the clinical laboratory. Dr. Barney J. Venables, Professor in Biological Sciences, was David's mentor.

Dr. Jyoti Shah, Distinguished Research Professor in Biological Sciences, was invited by Frontiers in Plant Sciences to be the lead Guest Editor for a focus issue '*Advances in Plant-Hemipteran Interaction*'. Dr. Linda Walling, Professor in the Department of Botany and Plant Sciences at University of California-Riverside is the guest co-editor of this focus issue.

Thesis and Dissertations

Ana Paula Ferrari-Hoeinghaus successfully defended her Ph.D. dissertation in October 2015. Dissertation title: *Thresholds and legacy effects of tropical floodplain fish assemblages in response to flood attributes*. Drs. Tom La Point, Professor in Biology, and Samuel Atkinson, Regents Professor in Biology, were her major advisors, and she collaborated with Dr. David Hoeinghaus and colleagues at the Upper Paraná River Floodplain Long Term Ecological Research program in Brazil.



Dr. Ana Paula Ferrari-Hoeinghaus

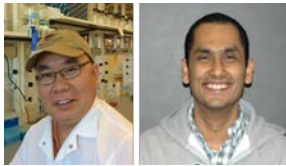
Aswad Khadilkar successfully completed his Ph.D. in Biochemistry and Molecular Biology. Dissertation title: *Manipulations of sucrose/proton symporters and proton-pumping pyrophosphatase lead to enhanced phloem transport but have contrasting effects on plant biomass*. Associate Professor Dr. Brian Ayre was his major advisor. Dr. Khadilkar is now a Postdoctoral Scholar at the University of Texas Southwestern Medical Center in Dallas.



Drs. Aswad Khadilkar and Lee Toni

Lee Toni successfully defended his Ph.D. dissertation in October 2015. Dissertation title: *Characterizing the molecular changes of *Austrofundulus limnaeus* as it develops towards and enters diapause II*. Associate Professor Dr. Pamela Padilla was his major advisor.

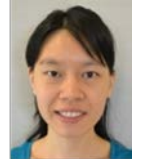
New Faculty and Staff Appointments, and Visiting Scientists



Drs. MingXiong (David) Pang and Bikash Adhikari,

Dr. MingXiong (David) Pang joined Associate Professor Brian Ayre's Lab as a Research Assistant Professor. Dr. Pang is developing virus-based technologies to control flowering and plant architecture, principally in sorghum.

UNT alumnus **Dr. Bikash Adhikari** (Ph.D. 2015) joined Dr. Xiaogiang (XQ) Wang's lab as a post-doctoral scientist. Regents Professor Dr. Kent Chapman was Dr. Adhikari's Ph.D. mentor.



Dr.Chunliu Zhuo

Dr. Chunliu Zhuo, who received her Ph.D. from the South China Agricultural University, joined Distinguished Research Professor Dr. Richard Dixon's lab as a postdoctoral associate.

Recent Publications

Bateson, Z.W., Whittingham, L.A., Johnson, J.A, and Dunn, P.O. (2015) Contrasting patterns of selection and drift between two categories of immune genes in prairie-chickens. *Molecular Ecology*. 24:6095-6106. <http://onlinelibrary.wiley.com/doi/10.1111/mec.13459/abstract>

Contador, T.A, Kennedy, J.H., Rozzi, R., and Ojeda, J. (2015). Sharp altitudinal gradients in Magellanic sub-Antarctic streams: thermal patterns and benthic macroinvertebrate communities along a fluvial system in the Cape Horn Biosphere Reserve. *Polar Biology* 38:1853-1866 <http://link.springer.com/article/10.1007/s00300-015-1746-4>

Contador, T., Rosenfeld, S., Ojeda, J., and Kennedy, J. (2015). *Historia natural de los invertebrados acuáticos del Cabo de Hornos*. Explora CONICYT, Santiago, Chile. 201pp. ISBN: 978-956-358-448-6

Ghaste, M., Narduzzi, L., Carlin, S., Vrhovsek, U., Shulaev, V., and Mattivi, F. (2015). Chemical composition of volatile aroma metabolites and their glycosylated precursors that can uniquely differentiate individual grape cultivars. *Food Chem*. 188:309-319. <http://www.sciencedirect.com/science/article/pii/S0308814615006020>

Hammerly, S.C., de la Cerda, D.A., Bailey, H., and Johnson, J.A. (2015). A pedigree gone bad: increased offspring survival after using DNA-based relatedness to minimize inbreeding in a captive population. *Animal Conservation* DOI: 10.1111/acv.12247. <http://onlinelibrary.wiley.com/doi/10.1111/acv.12247/abstract>

Kanteti, R., Dhanasingh, I., El-Hashani, E., Riehm, J.J., Stricker, T., Nagy, S., Zaborin, A., Zaborina, O., Biron, D., Alverdy, J.C., Im, H.K., Siddiqui, S., Padilla, P.A., and Salgia, R. (2015). *C. elegans* and mutants with chronic nicotine exposure as a novel model of cancer phenotype. *Cancer Biol. Ther.* Nov 17:0 <http://www.tandfonline.com/doi/abs/10.1080/15384047.2015.1108495?journalCode=kcbt20>

Keereetaweep, J., and Chapman, K.D. (2016). Lipidomic analysis of endocannabinoid signaling: Targeted metabolite identification and quantification. *Neural Plasticity*, vol. 2016, Article ID 2426398, 13 pages, 2016. doi:10.1155/2016/2426398. In Special Issue on Endocannabinoids. <http://www.hindawi.com/journals/np/2016/2426398/>

Khadilkar, A.S., Yadav, U.P., Salazar, C., Shulaev, V., Paez-Valencia, J., Pizzio, G.A., Gaxiola, R.A., and Ayre, B.G. (2016) Constitutive and companion cell-specific overexpression of *AVP1*, encoding a proton-pumping pyrophosphatase, enhances biomass accumulation, phloem loading and long-distance transport. *Plant Physiol.* 170: 401-414. doi: 10.1104/pp.15.01409. <http://www.plantphysiol.org/content/170/1/401.full>.

Levitt, D.E., Duplanty, A.A., Budnar, Jr., R.G., Luk, H.Y., Fernandez, A., Layman, T.J., Fancher, D.L., Hill, D.W., McFarlin, B.K., and Vingren, J.L. (2015). The effect of post-resistance exercise alcohol ingestion on lipopolysaccharide-stimulated cytokines. *Eur. J. Appl. Physiol.* 2015 Oct 26. [Epub ahead ofprint] PMID: 26501345. <http://link.springer.com/article/10.1007/s00421-015-3278-6>

Lima Junior, D.P., Hoeninghaus, D.J., Bini, L.M., and Agostinho, A.A. (2015.) Are non-native species larger in their invaded range? A test with tropical floodplain fish assemblages following inundation of a biogeographic barrier. *Biological Invasions* 17: 3263-3274. <http://link.springer.com/article/10.1007/s10530-015-0951-y>

M. Gañán Mora, M, Contado, T.A., and Kennedy, J.H. (2015). La vida en los extremos: el uso de SIG para estudiar la distribución de la mosca antártica alada, *Parochlus steinenii* (Diptera: Chironomidae) en las Islas Shetland del Sur (*Antártica marítima*). In *Análisis espacial y representación geográfica: innovación y aplicación*. de la Riva, J., Ibarra, P., Montorio, R., Rodrigues, M. (Eds.) 1599-1608. Universidad de Zaragoza-AGE. ISBN: 978-84-92522-95-8

- Nalam, V. J., Alam, S., Keereetaweep, J., Venables, B., Burdan, D., Lee, H., Trick, H.N., Sarowar, S., Makandar, R., and Shah, J. (2015). Facilitation of *Fusarium graminearum* infection by 9-lipoxygenases in *Arabidopsis* and wheat. *Mol. Plant-Microbe Interact.* 28:1142-1152.
- Nallani, G., Edziyie, Paulos, P., Venables, B., Constantine, L., and Huggett, D. (2015). Bioconcentration of two Basic Pharmaceuticals Verapamil and Clozapine in Fish. *Env. Toxicol. Chem.* doi: 10.1002/etc.3244. [Epub ahead of print]
- Pendleton, R.M., Hoeinghaus, D.J., Gomes, L.C., and Agostinho, A.A. (2015). Trophic downgrading results in complex ecosystem dynamics in experimental tropical floodplain food webs. *Hydrobiologia* 760:15-28. <http://link.springer.com/article/10.1007/s10750-015-2299-9>
- Pizzio, G.A., Paez-Valencia, J., Khadilkar, A.S., Regmi, K., Patron-Soberano, A., Zhang, S., Sanchez-Lares, J., Furstenau, T., Li, J., Sanchez-Gomez, C., Valencia-Mayoral, P., Yadav, U.P., Ayre, B.G., and Gaxiola, R.A. (2015). *Arabidopsis* type I proton-pumping pyrophosphatase expresses strongly in phloem, where it is required for pyrophosphate metabolism and photosynthate partitioning. *Plant Physiol.* 167: 1541-1553. doi: 10.1104/pp.114.254342. <http://www.plantphysiol.org/content/167/4/1541.full>.
- Price, E.R., Brun, A., Gontero-Fourcade, M., Fernández-Marinone, G., Cruz-Neto, A.P., Karasov, W.H., and Caviedes-Vidal, E. (2015). Intestinal water absorption varies with expected dietary water load among bats but does not drive paracellular nutrient absorption. *Physiol. Biochem. Zool.* 88: 680-84. <http://www.journals.uchicago.edu/doi/abs/10.1086/683114>
- Rahlouni, F., Szarka, S., Shulaev, V., and Prokai, L. (2015). A survey of the Impact of deylolking on biological processes covered by shotgun proteomic analyses of Zebrafish embryos. *Zebrafish.* 12:398-407. <http://online.liebertpub.com/doi/10.1089/zeb.2015.1121>
- Ramesh, D., Ayre, B.G., Webber, C.L. III, D'Souza, N.A. (2015). The effect of retting on mechanical properties, surface chemistry and morphology of kenaf fibers. *Textile Res. J.* 85: 2059-2070 doi: 10.1177/0040517515576322. <http://trj.sagepub.com/content/85/19/2059.full>
- Schulwitz, S.E., Chumchal, M.M., and Johnson, J.A. (2015). Mercury concentrations in birds from two atmospherically contaminated sites in north Texas, USA. *Archives of Environmental Contamination and Toxicology* 69: 390-398. <http://link.springer.com/article/10.1007%2Fs00244-015-0189-9>
- Sturtevant, D., Lee, Y.J., Chapman, K.D. (2015). Matrix assisted laser desorption/ionization-mass spectrometry imaging (MALDI-MSI) for direct visualization of plant metabolites in situ. *Curr. Opin. Biotechnol.* 37:53-60. doi: 10.1016/j.copbio.2015.10.004. Review. PMID: 26613199
- Suzuki, N., Devireddy, A.R., Inupakutika, M.A., Baxter, A., Miller, G., Song, L., Shulaev, E., Azad, R., Shulaev, V., and Mittler, R. (2015). Ultra-fast alterations in mRNA levels uncover multiple players in light stress acclimation in plants. *Plant J.* 84: 760-772. <http://onlinelibrary.wiley.com/doi/10.1111/tpj.13039/abstract>
- Toni, L., and Padilla, P.A. (2015). Developmentally arrested *Austrofundulus limnaeus* embryos have changes in post-translational modifications of histone H3. *J. Exp. Biol.* Online Dec 18 2015; <http://jeb.biologists.org/content/early/2015/12/17/jeb.131862.long>
- Tripathi, P., Rabara, R.C., Shulaev, V., Shen, Q.J., and Rushton, P.J. (2015). Understanding water-stress responses in soybean using hydroponics system-A systems biology perspective. *Front. Plant Sci.* 6:1145. doi: 10.3389/fpls.2015.01145. <http://journal.frontiersin.org/article/10.3389/fpls.2015.01145/abstract>
- Yadav, U.P., Ayre, B.G., and Bush, D.R. (2015). Transgenic approaches to altering carbon and nitrogen partitioning in whole plants: Assessing the potential to improve crop yields and nutritional quality. *Front. Plant Sci.* 6: 275 (1-13) doi: 10.3389/fpls.2015.00275. <http://journal.frontiersin.org/article/10.3389/fpls.2015.00275/full>

Extramural Grants and Contracts

Botanicals Center on Dietary Polyphenols in the Preservation and Promotion of Cognitive Wellness and Psychological Resiliency. National Institutes of Health (Office of Natural Supplements, NCCAM). (Co-PI R.A. Dixon). \$700,918

Collaborative Activities to Promote Metabolomics Research. NIH (NIAID). PI - Roepe (Georgetown University), Subcontract PI – V. Shulaev (UNT); Co-PI – Sullivan (John Hopkins University), \$150,000.

Development of “Virus-Induced Flowering” (VIF) to benefit breeding among wild and domesticated photoperiodic accessions of sugar cane. American Sugarcane League. PIs: S. Brumbley and B.G. Ayre, \$25,000.

Development of “Virus-Induced Flowering” (VIF) to benefit breeding among wild and domesticated photoperiodic accession of sorghum. United Sorghum Checkoff Board. PI: B.G. Ayre, \$225,000.

Understanding the role of phosphatidylethanolamine binding protein family members in cotton and their application to enhance growth habit as an annual row crop. Cotton Incorporated National Program. PI: B.G. Ayre. \$50,000 (renewed annually)

Unraveling the link between carbohydrate transport and phosphate use: Can we improve carbon partitioning and reduce nutrient use? National Science Foundation. PI: B.G. Ayre. \$564,315.

Seminars/Talks

A Multi-assay Evaluation of the Sub-lethal Effects of Chlorpyrifos on Developing Zebrafish (Danio rerio). Society of Toxicology and Environmental Chemistry North America 36th Annual Meeting, Salt Lake City, UT., 4 November 2015. Presenter: Ty Curran, co-author: B. Venables.

Assembling Lipid Droplets in Plant Cells: Some New Insights from Human Lipodystrophies. Biology Department Seminar Series, Trinity University, San Antonio, TX Nov 2, 2015. Seminar presented by Kent Chapman

Balancing a Scientific Academic Career. SACNAS National Conference, Washington DC, October 2015. Invited Talk by Dr. Pamela Padilla,

Bioactive Flavonoids- Biosynthesis, Engineering and Application in Neurodegenerative Disorders. The University of Houston, Department of Pharmacy, Houston, Texas, October 1, 2015. Invited talk by Dr. Richard Dixon.

Brominated flame retardants: Evidence for altered thyroid signaling and neurological development in Xenopus laevis tadpoles. Society of Toxicology and Environmental Chemistry North America 36th Annual Meeting, Salt Lake City, UT., 4 November 2015. Presenter: M.K. Sellin Jeffries; Co-authors: A.Y. Yost, L.M. Thornton, and B.J. Venables.

Cotton architecture in the balance: the Gossypium hirsutum SINGLE FLOWER TRUSS and SELF-PRUNING orthologs regulate branching patterns. Annual Meeting of the American Society of Plant Biologists, 2015, Minneapolis, MN. Presenter: Roisin C. McGarry; co-authors, Y. Eshed, E. Lifschitz, and B.G. Ayre.

Ethanolamide Oxylipins and Abscisic Acid Signaling during Arabidopsis Seedling Development. The 6th Asian Symposium on Plant Lipids/ Joint with the Singapore International Lipidomics Symposium, Invited Symposium Speaker, Singapore, November 30- December 5, 2015. Presented by Kent Chapman; Co-authors, Jantana Keereetaweep, Elison Blancaflor and Ivo Feussner.

Fish and Worms- Molecular Models for Stress Responses. Woods Hole Biological Labs, MA, October 2015. Invited Talk by Dr. Pamela Padilla.

Imaging Lipids in Plant Seed Tissues by Mass Spectrometry. Research Seminar Series, Department of Chemistry and Biochemistry, University of Southern Mississippi, Hattiesburg, MS, October 2, 2015. Seminar Presented by Dr. Kent Chapman.

Lipid Droplet Biogenesis in Plant Cells: Insights from Human Lipodystrophies. Institute for Biological Chemistry, Washington State University, Pullman, WA, Dec 15, 2015. Seminar presented by Kent Chapman.

Overexpression of AVP1, a Proton Pumping Pyrophosphatase, Stimulates Biomass Growth, Phloem Loading and Long-distance Transport in Arabidopsis. Annual Meeting of the American Society of Plant Biologists, 2015, Minneapolis, MN, Oral presentation by Dr. Umesh P. Yadav; Co-authors: A.S. Khadilkar, C. Salazar, V. Shulaev, J. Paez-Valencia, G.A. Pizzio, R.A. Gaxiola, and B.G. Ayre.

Small World Initiative. Texas Branch of the American Society for Microbiology Fall Meeting, Huntsville, TX, October 29-31, 2015. Invited talk by Dr. Lee Hughes.

Source/sink relations and pathways for carbohydrate transport and targeting in cotton. 2015 Beltwide Cotton Conferences, San Antonio, TX. Invited talk by Dr. Brian G. Ayre.

The Organizational Effects of PBDE-47 Exposure on Reproductive Function in Early Life Stage Fathead Minnows. Society of Toxicology and Environmental Chemistry North America 36th Annual Meeting, Salt Lake City, UT., 4 November 2015. Presenter: L.M. Thornton; Co-authors: E.M. Path, G.S. Nystrom, B.J. Venables, and M.K. Jeffries.

Visualizing Tissue Lipids by Mass Spectrometry. Research Seminar Series: Department of Biochemistry and Molecular Biology, Louisiana State University Medical Center, Shreveport, LA, Nov 5, 2015. Seminar presented by Kent Chapman.

Conference Presentations

Bridges, K.N., Soulen, B.K., Sweet, L.E. Venables, B.J., and Roberts, A.P. Embryotoxicity of maternally-transferred methylmercury to fathead minnows (*Pimephales promelas*). Society of Toxicology and Environmental Chemistry North America 36th Annual Meeting, Salt Lake City, UT., 6 November 2015.

Culpepper, S., McGarry, R.C., and Ayre, B.G. *A tale of two viruses: comparing Cotton leaf crumple virus and Tobacco rattle virus as tools to transiently manipulate gene expression in cotton.* Annual Meeting of the American Society of Plant Biologists, 2015, Minneapolis, MN.

Dill-Macky, R., Elakkad, A.M., Shah, J., Trick, H.N., Sarowar, S., Alam, S., Dahleen, L.S., Skadsen, R.W., and Bregitzer, P.P. *Testing Transgenic spring wheat and barley lines for reaction to Fusarium head blight: 2015 Field Nursery Report.* 2015 National Fusarium Head Blight Forum. St. Louis, MO, Dec 6-8, 2015.

McGarry, R.C., Eshed, Y., Lifschitz, E., and Ayre, B.G. *Cotton architecture in the balance: the Gossypium hirsutum SINGLE FLOWER TRUSS and SELF-PRUNING orthologs regulate branching patterns.* Annual Meeting of the American Society of Plant Biologists, 2015, Minneapolis, MN.

Shah, J., Sarowar, S., Alam, S., Shulaev, E., Behera, S., Lee, H., Tyagi, N., and Trick, H. *Engineering resistance against Fusarium graminearum in Wheat.* 2015 National Fusarium Head Blight Forum. St. Louis, MO, Dec 6-8, 2015.

Soulen, B.K., Gnau, J., Venables, B.J., Johnston, D.W., and Roberts, A.P.: *Accumulation of PBDEs of in stranded harp (Pagophilus groenlandicus) and hooded seals (Cystophora cristata) from the Northeastern United States*. Society of Toxicology and Environmental Chemistry North America 36th Annual Meeting, Salt Lake City, UT., 6 November 2015.

Thornton, L.M., Path, E.M., Nystrom, G.S., Venables, B.J., and Jeffries, M.K. *Comparing the effects of PBDEs on reproductive and thyroid function in adult and early life stage fathead minnows*. Presented at the Society of Toxicology and Environmental Chemistry North America 36th Annual Meeting, Salt Lake City, UT, 6 November 2015.

Yadav, U.P., Khadilkar, A.S., Salazar, C., Shulaev, V., Paez-Valencia, J., Pizzio, G.A., Gaxiola, R.A., and Ayre, B.G. *Overexpression of AVP1, a proton pumping pyrophosphatase, stimulates biomass growth, phloem loading and long-distance transport in Arabidopsis*. Annual Meeting of the American Society of Plant Biologists, 2015, Minneapolis, MN.

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

Phone (940) 565-3591

Mailing Address

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

Fax: (940) 565-3821

Web: <https://biology.unt.edu/>