A green light to greatness.

DEPARTMENT OF BIOLOGICAL SCIENCES
UNIVERSITY OF NORTH TEXAS

June 2016

BIOsphere

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Awards and Recognitions

Dr. Lee Hughes

Dr. Lee Hughes was selected as a University Distinguished Teaching Professor. This award recognizes tenured faculty at the rank of professor or associate professor who perform outstanding teaching, instruct at the introductory levels of their disciplines, and promote continuous development of teaching excellence and improvement among their colleagues in the UNT community.

At UNT's 2016 Inaugural Wingspan Gala, University Distinguished Research Professor **Dr. Richard A. Dixon** was presented with the Presidential Excellence Award for his world-renowned research in metabolic engineering of plants.

Dr. Richard Dixon

Dr. Warren Burggren

Dr. Warren Burggren, Professor in Biology, was honored with the Krogh Distinguished Lectureship by the American Physiological Society's Comparative and Evolutionary Section. He will deliver the annual Krogh Lecture in April 2017 at the Experimental Biology Meeting in Chicago, IL.

Mearaj A. Shaikh

Sarah Prewitt

Kudos to **Mearaj A. Shaikh**, doctoral student in the Biochemistry and Molecular Biology Program who was awarded **1st place**, which included a $500 award, for the Best Research Poster Presentation in The Federation of North Texas Area Universities 7th Annual Federation Research Symposium in Science, Technology, Engineering and Math. This event included graduate research poster presentations from Texas A&M University at commerce, TWU and UNT. The aim of the event was to promote current scientific research understanding among STEM students and the public. Associate Professor Dr. Brian G Ayre is Mearaj's PhD advisor.

Congratulations to **Sarah Prewitt**, doctoral student in the Biochemistry and Molecular Biology Program, who is the recipient of a competitive student travel grant from the American Society of Plant Biologists to attend and present research at "Plant Biology 2016" in Austin, TX (July 8th-14th, 2016). Dr. Brian G. Ayre, Associate Professor in Biology, is Sarah's PhD advisor.

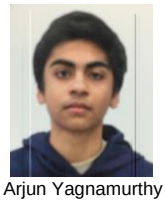
Dr. Mrunmay Giri

Dr. Mrunmay Giri, postdoctoral fellow in University Distinguished Research Professor Dr. Jyoti Shah's lab, was awarded a competitive travel grant by the International Society of Molecular Plant-Microbe Interaction (IS-MPMI) to present his research at the XVIII Congress of the IS-MPMI, which will be held in Portland, OR (July 17-21, 2016).

Dr. Ed Dzialowski with some of the Outstanding TA and Undergraduate Scholarship awardees

The Annual Outstanding TA and Undergraduate Scholarship Luncheon was held on April 21, 2016 at the Greenhouse Restaurant. The Outstanding Teaching Assistant recipients are **Rohit Singh, Kristin Bridges, Andrew Barker, Dedric Taylor** and **Ravi Pandey**. The David Redden Scholarship recipients are **Kevin Rivera, Davis Szymanski, Michelle Long, Bradley Osemwengie, Sabreen Shalabi, Maryam Farooq, Angelica Abuana, Kinny Xavier, Clara Oliva, Andru Widener, Adekanyinsola Adeyemo** and **Stephanie Samuel**. This scholarship honors David Redden, who died doing what he loved; teaching. He taught Animal Physiology and was the Pre-Med Advisor for the department. The Tad Lott Scholarship recipient is **Travis Bryant**. Tad Lott who taught Anatomy and Physiology in the department was by all accounts, a fair but tough professor such that there were sweatshirts made by the student that said "I survived Lott's A&P. The Gladys Crawford Scholarship recipients are **Pinky Gurung, Meghann Stokes** and **Nicholas Thompson**. Gladys Crawford worked for UNT for over 50 years till she retired in 2003. She acted as the sole director of the Medical Technologist program at UNT for much of that time. The Tracy Quay Scholarship recipient is **Rachel Duffy**. Tracey Lynn Quay was a UNT Alumni who passed away while still young. She dedicated her short life to biomedical research and made essential contributions to the investigation of tumor necrosis factor (TNF), a cytokine that mediated programmed cell death and the immune responses in humans and animals. The loved ones whom Tracey left behind wanted to carry on her legacy of devotion to research and biology by supporting younger scientists in their endeavors. The Eugene Medford Scholarship recipients are **Desirey Flores** and **Kody Hughes**. The Paramount/Outstanding Senior recipients are **Caitlin Fellers** and **Elizabeth Mathers**. This scholarship is funded by Paramount Pictures.

Congratulations to Biology graduate students **Sujata Agarwal, Zulkarnain Chowdhury, Sarah Prewitt, Mearaj A. Shaikh** and **Amith Reddy** who were awarded travel grants by the College of Arts and Sciences to present their research at upcoming conferences. Amith also received matching travel grants from UNT's Student Government Association and the Toulouse Graduate School. Sujata, Sarah, Mearaj and Amith will present their work at the Plant Biology 2016 meeting hosted by the American Society of Plant Biologists in Austin, TX (July 8-14, 2016), while Zulkarnain will present his work at the XVII Congress of the International Society of Molecular Plant-Microbe Interaction, which will be held in Portland, OR (July 17-21, 2016).


Arjun Yagnamurthy

Arjun Yagnamurthy, junior at the Texas Academy of Mathematics and Sciences, was honored on Honors Day (April 1, 2016) for the following achievements associated with his research on plant stress response. Arjun was the Regional Finalist in the Siemens Competition, received First place in Plant Sciences at the Fort Worth Science and Engineering Fair, qualified for the Intel International Science and Engineering Fair, and attained 2nd place in Botany at the Texas Junior Academy of Science (TJAS) symposium. University Distinguished Research Professor Dr. Jyoti Shah is Arjun's research mentor.

Other News

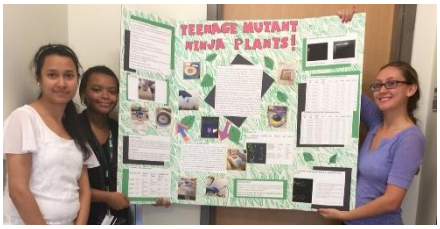
The Biology Graduate Student Association organized the Graduate Student Research Day, which was held on April 22, 2016. **Dr. Z. Jeffery Chen**, D. J. Shilbey Centennial Professor in Plant Molecular Genetics at University of Texas at Austin, was the plenary speaker who presented a talk titled '*Genomic and Epigenetic Bases for Polyploidy and Heterosis*'. Oral and poster resentations were also made by graduate students, who competed for prizes. The top three students in the oral category were: First place: **Edmond Rogers** (advisor: Dr. Guenter Gross), Presentation Title: *Network Trauma: Electrophysiological and Subcellular Damage after Tangential 300-600g Impacts in vitro*. Second place: **Amith Reddy** (advisor: Dr. Ron Mittler), Presentation Title: *Ultra-fast Alterations in mRNA Levels Uncover Multiple Players in Light Stress Acclimation in Plants*. Third place: **Feroza Choudhury** (advisor: Dr. Vladimir Shulaev), Presentation Title: *Metabolic Profiling of Systemic Signaling in Plants*. The top three students in the Poster Presentation category were: First place: **Zulkarnain Chowdhury** (Advisor: Dr. Jyoti Shah), Poster Title: *Dehydroabietinal Signaling in Systemic Acquired Resistance and Flowering.* Second place: **Ravishankar Pandey** (Advisor: Dr. Rajeev Azad), Poster Title: *Towards more Robust Metagenomic Profiling*. Third place: **Elizabeth McClinchie** (Advisor: Dr. Kent Chapman). Poster title: *Expression of Mus musculus Fat Storage-inducing Transmembrane Protein 2 (FIT2) in Nicotiana benthamiana and Arabidopsis thaliana Promotes Lipid Droplet Accumulation*.


Graduate day oral presentation winners Edmond Rogers, Amith Reddy and Feroza Choudhury (upper row), and poster presentation winners Zulkarnain Chowdhury, Ravishankar Pandey and Elizabeth McClinchie (bottom row)

Congratulations to the newly elected Biology Graduate Student Association (BGSA) Committee members **Amith Reddy** (President-Elect), **Monika Patel** (Vice President-Elect), **Prajita Pandey** (Secretary-Elect), and **Subhayu Nayek** (Treasurer-Elect). This new committee will take charge in fall 2016. Amith Reddy is 3rd year doctoral student in Dr. Ron Mittler's group. His research focuses on determining ultra-fast alterations in metabolome and transcriptome of Arabidopsis in response to abiotic stress. Monika Patel is a 4th year doctoral student in Dr. Jyoti Shah's group. Her research involves studying the role of WRKY transcription factors in plant defense against insects. Prajita Pandey is a second year doctoral student in Dr. Vladimir Shulaev's group. She is working on a project that aims to understand the mechanism of oxidative stress response, using yeast as model system. Subhayu Nayek is a first year doctoral student in Dr. Jyoti Shah's group. His research deals with long-distance signaling associated with systemic acquired resistance in plants. A big thanks to the out-going committee members Devasantosh Mohanty, Mearaj Shaikh, Monika Patel and Moon Twayana.


BGSA Committee Members Amith Reddy, Monika Patel, Prajita Pandey and Subhayu Nayek

Congratulations to **Rajashree Pradhan**, doctoral student in Dr. Rebecca Dickstein's lab, for her outstanding mentorship of high school students **Sarah Dunn** and **Tracy Owens** through UNT's Upward Bound program. Sarah and Tracy took the first prize for both Biology research and for overall Science in this summer's intensive Upward Bound science camp.



Rajashree Pradhan, Tracy Owens and Sarah Dunn with their poster 'Teenage Mutant Ninja Plants'


Dr. Vijaykumar Veerappan

Dr. Vijaykumar Veerappan, post-doctoral fellow in the Department of Biological Sciences has accepted a faculty position at Eastern Connecticut State University as an Assistant Professor. Congratulations and best wishes to Dr. Veerappan on this new phase of his career. Dr. Veerappan's faculty mentor is Dr. Rebecca Dickstein, Professor of Biochemistry.

Dr. Rebecca Dickstein was nominated and agreed to serve on the newly formed Bee Campus USA Committee. Bee Campus USA has accepted UNT's application to become the 12th certified institution in the country, and the first in the state of Texas. Bee Campus USA is a sustainability organization focused on pollinators and pollinator habitats.


Dr. Rebecca Dickstein

Dr. Rebecca Dickstein, Professor of Biochemistry, was the Local Host for the Southern Section of the American Society of Plant Biologists 2016 Annual Meeting, held April 2-4, 2016 on UNT's campus. Over 145 plant biologists from 24 institutions participated. The meeting featured 62 oral presentations and 49 poster presentations, with 12 posters coming from undergraduate students. The Kriton-Hatzios Symposium focused on genome editing, with three prominent scientists who work in this cutting-edge field: Dr. Dr. Yinong Yang of Penn State, University, Dr. Yunde Zhao of UC San Diego, and Dr. J. Pon Samuel of Dow AgroSciences. The conference featured a field trip for participants to the Botanical Research Institute of Texas and the Ft. Worth Botanic Garden.

Outreach Activities

The Department of Biological Science's BS in Ecology Program has partnered with the Peregrine Fund's American Kestrel Partnership to build American Kestrel nest boxes to be placed at the UNT Water Research Field Station and the UNT Urban Observatory. Under the guidance of **Drs. Jaime Baxter-Slye, Bruce Hunter**, and **Jeff Johnson,** Ecology undergraduates **Rebecca Burkhalter, Elida Silva, Callie Smith, Morgan Van Aken,** and **Daniel Witt** have volunteered to help build, install, and monitor these nest boxes. The new undergraduate Ecology lab (BIOL2141) and the students of SEEDS will begin monitoring and reporting clutch size and fledgling activity after Fall 2017. The data will be reported to the nationwide American Kestrel Partnership database. Additional boxes are located at the Lewisville Lake Educational Learning Area (LLELA) under the direction of Drs. Ken Steigman and Jim Bednarz.

Thesis and Dissertations

Mary Ladage

Daniel Quan

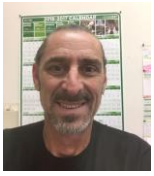
Mary Ladage successfully defended her doctoral dissertation that addressed the impact a sugar diet has on cellular functions and oxygen deprivation responses. Dissertation Title: *Glucose and Altered Ceramide Biosynthesis Impact the Transcriptome and the Lipidome of Caenorhabditis elegans*. Associate Professor Dr. Pamela Padilla was her advisor.

Chris James

Daniel Quan successfully defended his MS thesis that addressed the role cytochrome P450 genes have in oxygen deprivation responses. Thesis Title: *Cytochrome P450 Gene Expression Modulates Anoxia Sensitivity in Caenorhabditis elegans*. Associate Professor Dr. Pamela Padilla was his advisor.

Chris James successfully defended his MS thesis titled "*Influence of a Human Lipodystrophy Gene Homologue on Neutral Lipid Accumulation in Arabidopsis Leaves*". Regents Professor Dr. Kent Chapman was his advisor.

Appointments & Retirements



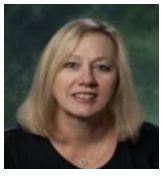
Christopher Shadle

Shari James

Welcome to our new and returning staff members. **Christopher Shadle** joined the department as Purchasing Assistant in the Biology Stockroom. **Shari James** was hired as Administrative Coordinator with the BioDiscovery Institute at UNT. **Martha Frantz** returned to the department as a Research Analyst I working with the Physiology and Neurobiology Division. She will assist faculty within the Physiology and Neurobiology Division with paperwork pertaining to grants, balancing accounts and provide additional support with grants, as needed.

Dr. Amélie Crespel

Dr. Amélie Crespel joined Dr. Warren Burggren's lab as a postdoctoral fellow. Dr. Crespel received her PhD degree from the University of Québec in Rimouski, Canada. Her research interests are aimed at understanding the phenotypic evolution of vertebrate through different time scales. She is interested in environmental (phenotypic plasticity), trans-generational (epigenetics) and genetic (evolution) effects in the adaptive response of fish to environmental disturbance. Her current research is focused on the analysis of the molecular basis (histone modification and DNA methylation) underlying the transgenerational effects of various environmental stressors such as pollutants (polycyclic aromatic hydrocarbons) or hypoxia events.



Margaret Hall

Dr. Michael Scott Greer joined Dr. Kent Chapman's lab as a postdoctoral fellow. He received his MS degree from the University of Lethbridge (Canada) and his PhD degree from the University of Alberta (Canada) working on lipid metabolism in plants and lipid biotechnology under the guidance of Dr. Randall Weselake. His research in the Chapman group focuses on how plants package and store their oil once they have synthesized it.

Dr. Michael S. Greer

Margaret Hall retired after 26 years of service to the University. Her most recent appointment was as Administrative Coordinator with the Plant Signaling Cluster. Best wishes to Margaret on this new chapter in her life.

Patents

Dickstein, R., Salehin, M., Bagchi, R. (2016) *MtNIP* Regulated Plants with Significantly Increased Size and Biomass. US Patent No. 9, 297,021.

Recent Publications

Barros-Rios, J., Romani, A., Peleteiro, S., Garrote, G., and Ordas, B. (2016) Second-generation bioethanol of hydrothermally pretreated stover biomass from maize genotypes. Biomass and Bioenergy. 90: 42-49. http://www.sciencedirect.com/science/article/pii/S0961953416300915

Barros-Rios, J., Serrani-Yarce, J.C., Chen, F., Baxter, D., Venables, B.J., and Dixon, R.A. (2016) Role of bifunctional ammonia-lyase in grass cell wall biosynthesis. Nature Plants. DOI: 10.1038/nplants.2016.50**.** http://www.nature.com/articles/nplants201650

Baxter, H., Alexander, L., Mazarei, M., Haynes, E., Turner, G., Sykes, R., Decker, S., Davis, M., Dixon, R.A., Wang, Z-Y., and Stewart, N. (2016) Hybridization of downregulated-COMT transgenic switchgrass lines with field selected switchgrass for improved biomass traits. Euphytica. DOI: 10.1007/s10681-016-1632-3. http://link.springer.com/article/10.1007%2Fs10681-016-1632-3

Campbell, B.T., K.D. Chapman, Sturtevant, D. Kennedy, C. Horn, P., Chee, P.W., Lubbers, E., Meredith, W.R., Johnson, J., Fraser, D., and Jones, D.C. (2016) Genetic analysis of cottonseed protein and oil in a diverse cotton germplasm. Crop Sci. doi:10.2135/cropsci2015.12.0742.

Chen, X., Ma, Q., Rao, X., Tang, Y., Zhang, C., Wang, Y., Li, G., Mao, X., Dixon, R.A., and Xu, Y. (2016) Genome-scale identification of cell-wall related genes in switchgrass through comparative genomics and computational analyses of transcriptomic data. BioEnergy Res. 9, 172-180. http://link.springer.com/article/10.1007%2Fs12155-015-9674-2

Cookson, S., Yadav, U.P., Klie, S., Morcuende, R., Usadel, B., Lunn, J., Stitt, M. (2016) Temporal kinetics of the transcriptional response to carbon depletion and sucrose readdition in Arabidopsis seedlings. Plant Cell Environ. 39:768-786. http://onlinelibrary.wiley.com/doi/10.1111/pce.12642/abstract;jsessionid=201E5AA8822BCC04B6B8578DB6BABB52.f01t01

Ghaste, M., Mistrik, R., and Shulaev, V. (2016) Applications of Fourier Transform Ion Cyclotron Resonance (FT-ICR) and Orbitrap Based High Resolution Mass Spectrometry in metabolomics and lipidomics. Int. J. Mol. Sci. 17: 816. http://www.mdpi.com/1422-0067/17/6/816

Gidda, S.K., Park, S., Pyc, M., Yurchenko, O., Cai, Y., Wu, P., Andrews, D.W., Chapman, K.D., Dyer, J.M. and Mullen, R.T. (2016) Lipid droplet-associated proteins (LDAPs) are required for the dynamic regulation of neutral lipid compartmentation in plant cells. Plant Physiol. 170: 2052-2071. http://www.plantphysiol.org/content/170/4/2052.long

Gilroy, S., Białasek, M., Suzuki, N., Górecka, M., Devireddy, A.R., Karpiński, S., and Mittler, R. (2016) ROS, calcium and electric signals: Key mediators of rapid systemic signaling in plants. Plant Physiol. doi:10.1104/pp.16.00434 http://www.plantphysiol.org/content/early/2016/05/12/pp.16.00434.full.pdf+html

Ha, C.M., Escamilla-Trevino, L., Serrani Yarce, J.C., Kim, H., Ralph, J., Chen, F., and Dixon, R.A. (2016) An essential role of caffeoyl shikimate esterase in monolignol biosynthesis in *Medicago truncatula*. Plant J. DOI: 10.1111/tpj.13177. http://onlinelibrary.wiley.com/doi/10.1111/tpj.13177/epdf

Hamilton, J.S., Gorishek, E.L., Mach, P.M., Sturtevant, D., Ladage, M.L., Suzuki, N., Padilla, P.A., Mittler, R., Chapman, K.D. and Verbeck, G.F. (2016) Evaluation of a custom single Peltier-cooled ablation cell for elemental imaging of biological samples in laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS). J. Analytical Atomic Spectrometry. 31: 1030-1033.

McGarry, R.C., Prewitt, S.F., Culpepper, S., Eshed, Y., Lifschitz, E., and Ayre, B.G. (2016) Monopodial and sympodial branching architecture in cotton is differentially regulated by the *Gossypium hirsutum SINGLE FLOWER TRUSS* and *SELF-PRUNING* orthologs. New Phytol. doi: 10.1111/nph.14037. http://onlinelibrary.wiley.com/wol1/doi/10.1111/nph.14037/abstract
***This manuscript is presented as a Research Highlight in the July 2016 issue of Nature Plants*.**

Montgomery, C.L., Keereetaweep, J., Johnson, H.M., Grillo, S.L., Chapman, K.D. and Koulen, P. (2016) Changes in retinal N-acylethanolamines and their oxylipin derivatives during the development of visual impairment in a mouse model for Glaucoma. Lipids, 1-10. http://link.springer.com/article/10.1007/s11745-016-4161-x

Nar, M., Rizvi, H.R., Dixon, R.A., Chen, F., Kovalcik, A., and D'Souza, N. (2016) Superior plant-based carbon fibers from electronspun poly-(caffeyl alcohol). Carbon. 103: 372-383.

Pathak, S., Kumar, K.R., Kanta, H., Carr-Johnson, F., Han, J., Bashmakov, A., Faure, L., Ding, H., Vanarsa, K., Khan, S. and Li, Q.Z., Wakeland, E., Chapman, K.D., Mohan, C. (2016) Fatty acid amide hydrolase regulates peripheral B Cell receptor revision, polyreactivity, and B1 cells in Lupus. J. Immunol. 196: 1507-1516.

Shah, J., Giri, M.K., Chowdhury, Z., and Venables, B. J. (2016) Signaling function of dehydroabietinal in plant defense and development. *Phytochemistry Reviews*. doi: 10.1007/s11101-016-9466-0. http://link.springer.com/article/10.1007/s11101-016-9466-0

Sirsat, S.K.G., Sirsat, T.S., Price, E.R., and Dzialowski, E.M. (2016) Post-hatching development of mitochondrial function, organ mass, and metabolic rate in two ectotherms, the American alligator (*Alligator mississippiensis*) and the snapping turtle (*Chelydra serpentina*). Biol. Open. 5: 443-451. doi: 10.1242/bio.017160. http://bio.biologists.org/content/5/4/443 . ***This article was featured on the cover.***

Sirsat, S.K.G., Sirsat, T.S., Faber, A., Duquaine, A., Winnick, S., Sotherland, P.R., and Dzialowski, E.M. (2016) Development of endothermy and concomitant increases in muscle mitochondrial respiration in the precocial Pekin Duck (*Anas platyrhynchos domestica*). J. Exp. Biol. 219: 1214-1223. doi: 10.1242/jeb.132282.

Sirsat, T.S. and Dzialowski, E.M. (2016) Ventilation changes associated with hatching and maturation of an endothermic phenotype in the Pekin duck, *Anas platyrhynchos domestica*. Am. J. Physiol.: Reg., Integrat. Comp. Physiol. 312: 766-775. doi: 10.1152/ajpregu.00274.2015.

Snider, John L., Guy D. Collins, Jared Whitaker, Kent D. Chapman, and Patrick Horn. (2016) The impact of seed size and chemical composition on seedling vigor, yield, and fiber quality of cotton in five production environments. Field Crops Res. 193: 186-195.

Sturtevant, D., Lee, Y.-J. and Chapman, K.D. (2016). Matrix assisted laser desorption/ionization-mass spectrometry imaging (MALDI-MSI) for direct visualization of plant metabolites in situ. Curr. Opin. Biotechnol. 37: 53-60.

Veerappan, V., Jani, M., Kadel, K., Troiani, T., Gale, R., Mayes, T., Shulaev, E., Wen, J., Mysore, K.S., Azad, R.K., Dickstein, R. (2016) Rapid identification of causative insertions underlying *Medicago truncatula Tnt1* mutants defective in symbiotic nitrogen fixation from a forward genetic screen by whole genome sequencing. BMC Genomics. doi: 10.1186/s12864-016-2452-5. http://bmcgenomics.biomedcentral.com/articles/10.1186/s12864-016-2452-5

Wang, H., Yang, J.H., Chen, F., Torres-Jerez, I., Tang, Y., Wang, M., Du, Q., Cheng, X., Wen, J., and Dixon, R.A. (2016) Transcriptome analysis of secondary cell wall development in *Medicago truncatula.* BMC Genomics. 17, 23**.** DOI: 10.1186/s12864-015-2330-6. http://bmcgenomics.biomedcentral.com/articles/10.1186/s12864-015-2330-6

Editorial

Chapman, K. and Feussner, I. (2016) Plant lipid biology. Biochimica et Biophysica Acta (BBA)-Molecular and Cell Biology of Lipids.

Extramural Grants and Contracts

Molecular consequences of glucose diet and altered ceramide species impacting oxygen deprivation responses, National Institutes of Health NIDDK. Lead PI: Pamela Padilla, PI: Rajeev Azad, $445,342.

Regulation of Mitochondrial Functions by Iron and Ceramides in *C. elegans*, National Science Foundation, IOS, PI: Pamela Padilla, CoPI: Ron Mittler, $992,743.

Targeting host defense mechanism for enhancing FHB resistance in wheat. US Department of Agriculture. PI: Jyoti Shah, $25,004.

Seminars/Talks

A P450 is involved in the regulation of systemic acquired resistance in Arabidopsis. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2, 2016. Oral presentation by Mrunmay Giri (postdoctoral fellow). Co-authors: R. Chaturvedi, Z. Chowdhury, R. Petros, B.J. Venables, and J. Shah.

Additional functional characterization of Medicago truncatula MtNPF1.7 transporter. Southern Section of the American Society of Plant Biologists, April 2-4, 2016. Oral presentation by YaoChuan Yu (PhD student). Co-authors, Rammyani Bagchi (currently at UC San Diego), Mohammad Salehin (currently at UC San Diego), and Rebecca Dickstein.

Advanced research courses for undergraduates: A win for students, a win for faculty. ASM Microbe 2016, Boston, MA. June 17, 2016. Invited talk by Dr. Lee Hughes.

Arabidopsis SEIPIN proteins influence lipid droplet proliferation in plant cells. 2016 Meeting of the Southern Section of the American Society of Plant Biologists. Denton, TX. April 2-4, 2016. Presenter: Yingqi Cai (PhD student). Co-authors, Robert T. Mullen, John M. Dyer and Kent D. Chapman.

Assembling lipid droplets in plant cells: Some new insights from human lipodystrophies. 2016. Kent Chapman, Invited Seminar, Lycoming College, Department of Biology, Williamsport, PA, Feb 22, 2016.

Cardio-respiratory development in bird embryos: new insights from a venerable animal model. 1st International Meeting of Advances in Animal Science, Sao Paulo, Brazil, June 9, 2016. Talk by Dr. Warren Burggren.

Cardiotoxicity of Deepwater Horizon oil in Mahi-mahi larvae is temperature dependent. International Congress on the Biology of Fish, San Marcos, TX, USA, June 15, 2016. Authors: Perrichon P., Pasparakis C., Mager E.M., Stieglitz J.D., Benetti D.D., Grosell M., Burggren W.W.

Constitutive and companion cell-specific upregulation of Arabidopsis vacuolar proton-pumping pyrophosphatases enhance plant growth and stimulate phloem loading and long-distance transport. Annual meeting of the Southern Section of the American Society of Plant Biologists, Denton, TX, April 2-4, 2016. Presented by Dr. Umesh P. Yadav (postdoctoral fellow). Co-authors, Khadilkar AS, Salazar C, Shulaev V, Valencia JP, Gaxiola R, and Ayre BG.

Ethanolamide Oxylipins and Abscisic Acid Signaling During Arabidopsis Seedling Development. 2016. Kent Chapman, Invited Seminar, Texas Tech University, Department of Biology, Lubbock, TX, April 13, 2016. Co-authors, Jan Keereetaweep, Elison B. Blancaflor, Ivo Feussner.

Effects of ocean acidification upon physiological factors affecting swimming performance in the European sea bass (*D. labrax*). International Congress of the Biology of Fish, Physiological lessons from two high CO_2 worlds – future oceans and intensive aquaculture session, San Marcos, Texas, USA, June 15, 2016. Talk by Dr. Amélie Crespel (postdoctoral fellow). Co-authors, Pernelle Lelievre, Katja Antilla, José Zambonino-Infante, Patrick Quazuguel, Nicolas Le Bayon, Denis Chabot, Guy Claireaux.

Forward genetics and genome re-sequencing identifies genes required for symbiotic nitrogen fixation in Medicago truncatula. University of Louisiana, Layfayette, Layfayette, LA, April 21, 2016. Invited seminar by Dr. Rebecca Dickstein

Forward genetics to identify novel genes essential for symbiotic nitrogen fixation in Medicago truncatula. Southern Section of the American Society of Plant Biologists, April 2-4, 2016. Oral presentation by Rajashree Pradhan (PhD Student). Co-authors Vijaykumar Veerappan (Post-doc), J. Wen and Rebecca Dickstein.

Functional and phylogenetic analysis of cotton CETS genes. Annual meeting of the Southern Section of the American Society of Plant Biologists, Denton, TX, April 2-4, 2016. Graduate Student Oral Competition talk presented by Sarah Prewitt (PhD Student). Co-authors, Roisin C. McGarry and Brian G. Ayre.

How does nitrate affect Medicago truncatula NPF1.7 function? Southern Section of the American Society of Plant Biologists, April 2-4, 2016. Oral presentation by Jingya Cai (M.S. Student). Co-authors, Mohammad Salehin (currently at UC San Diego) and Rebecca Dickstein.

Lignin modification and its relation to pectin in the plant cell wall matrix. DOE BioEnergy Science Center Annual Meeting, Chattanooga, Tennessee, June 13, 2016. Invited talk by Dr. Lina Gallego-Giraldo.

Lipidomic analysis of nodules formed after interaction of Medicago truncatula with Sinorhizobium meliloti: Comparison of WT and a putative phospholipase-defective M. truncatula mutant. Southern Section of the American Society of Plant Biologists, April 2-4, 2016. Oral presentation by Dhiraj Dokwal (PhD Student). Co-author, Rebecca Dickstein.

Monopodial and sympodial branching architecture in cotton is differentially regulated by the Gossypium hirsutum SINGLE FLOWER TRUSS and SELF-PRUNING orthologs. 2016 Meeting of the Southern Section of the American Society of Plant Biologists, Denton, TX, April 2-4, 2016. Invited plenary talk by Dr. Roisin C. McGarry. Co-author Brian G. Ayre.

New pathways to old compounds: re-assessing the biosynthesis of lignin and condensed tannins. International Symposium on Agricultural Biotechnology: From Systems Biology to Translational Agriculture, Academia Sinica, Taipei, Taiwan, May 16, 2016. Invited talk by Dr. Richard Dixon.

NODULE INCEPTION protein appears to regulate latter stages of nodule development as well as early transcriptional changes. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2, 2016. Oral presentation by Kevin Schmitt (Ph.D. Student). Co-authors, Justin O'Brien (UG Student), Vijaykumar Veerappan (Postdoctoral fellow) and Rebecca Dickstein.

Organized programs and integrating research at 2-year Colleges. AC2 Bio-Link Regional Center Research Mentoring Workshop at Del Mar College, Corpus Christi, TX. April 29, 2016. Invited talk by Dr. Lee Hughes

Role of a WRKY transcription factor in Arabidopsis thaliana interaction with the green peach aphid, Myzus persicae. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2, 2016. Oral presentation by Monika Patel (PhD student). Co-authors: M. Patel, S. Sarowar, and J. Shah.

Role of bifunctional ammonia-lyase in grass cell wall biosynthesis. Southern Section of the American Society of Plant Biologists, Denton, Texas, April 2, 2016. Invited talk by Dr. Jaime Barros-Rios.

Role of the MYZUS PERSICAE-INDUCED LIPASE 1 (MPL1) gene in plant biotic stress. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2, 2016. Oral presentation by Sujon Sarowar (postdoctoral fellow). Co-authors: J. Louis, S. Behera, H. Mondal, and J. Shah.

Short-term phenotypic change: developmental plasticity, fetal programming and epigenetics. International Congress of the Biology of Fish, Physiological lessons from two high CO_2 worlds – future oceans and intensive aquaculture session, San Marcos, Texas, USA, June 14, 2016. Talk by Dr. Warren Burggren.

Switchgrass TOP line and system analysis. DOE BioEnergy Science Center Annual Meeting, Chattanooga, Tennessee, June 13, 2016. Invited talk by Dr. Richard Dixon.

The role of Actin Depolymerizing Factor 3 (ADF3) in plant defense against Myzus persicae, the green peach aphid. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2, 2016. Oral presentation by Lani Archer (PhD student). Co-authors: H. Mondal, M. Patel, S. Sarowar, D. Root, D. J. Shah.

Transcriptional profiling suggests new insights into regulation of Arabidopsis thaliana seedling development by N-linolenoylethanolamine. 2016 Meeting of the Southern Section of the American Society of Plant Biologists. Denton, TX. April 2-4, 2016. Presenter: Chengshi Yan. Co-authors, Jantana Keereetaweep, Bibi Rafeiza Khan, Rajeev Azad, Alan M. Jones, Elison B. Blancaflor, and Kent D. Chapman

Ultra-fast alterations in mRNA levels uncover multiple players in light stress acclimation in plants. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2, 2016. Oral presentation by Amith Reddy (PhD student).

Understanding the crosstalk between carbohydrate transport and phosphate use in plants with enhanced phloem partitioning from source to sink. Annual meeting of the Southern Section of the American Society of Plant Biologists, Denton, TX, April 2-4, 2016. Talk presented by Mearaj A Shaikh (PhD Student). Co-authors Brian G. Ayre.

Using whole genome sequencing and bioinformatics to identify defective genes from insertion lines in Medicago truncatula symbiotic nitrogen fixation mutants. Southern Section of the American Society of Plant Biologists, April 2-4, 2016. Oral presentation by Taylor Troiani (M.S. Student). Co-authors, Vijaykumar Veerappan (postdoctoral fellow), Mehul Jani (Ph.D. Student), Rajeev Azad and Rebecca Dickstein.

Conference Presentations

Adolfo, L., Rao, X., and Dixon, R.A. (2016). *Determining the C-glycosyltransferase involved in puerarin production*. Southern Section of the American Society of Plant Biologists, Denton, Texas. April 2016.

Aguayo, I., Haubrich, L., Lawand, A., Syed, N., and Hughes, L. *Isolation of the Wheelbite phage from Arthrobacter.* Texas Branch – ASM Spring Meeting, New Braunfels, TX. March-April 2016

Alberts, A. and Wright, A.J. *Cloning discordia2, a gene needed for asymmetric division plane orientation in Zea mays.* American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2016.

AlHassan, H. and Wright, A.J. *Identifying proteins that interact with maize microtubule severing proteins via yeast two hybrid*. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2016.

Alodailah, S. and Wright, A.J. *Testing the microtubule-severing activity of maize katanin, spastin, and fidgetin-like1*. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2016.

Ayre, B.G., Gaxiola, R., Yadav, U., and Shaikh, M.A. (2016) Comparing two approaches to enhance phloem loading and long-distance transport: Is a holistic approach required to increase plant productivity? International Workshop of Plant Membrane Biology 2016, Annapolis, MD, June 2016.

Baxter, H., Mazarei, M., Poovaiah, C., Fe, C., Shen, H., Biswall, G.L., Serba, D., Yee, K., Dumitrache, A., Natzke, J., Rodriguez, M. Jr., Thompson, O., Turner, G., Sykes, R., Decker, S., Davis, M., Mielenz, J., Davison, B., Brown, S., Saha, M., Tang, Y., Mohnen, D., Dixon, R.A., Wang, Z-Y., and Stewart, C.N. Jr. Field studies of BESC switchgrass TOP lines: recalcitrance, growth, and rust susceptibility. DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, TN.

Bomble, Y.J., Donohoe, B.S., Crowley, M.F., Hahn, M.G., Urbanowicz, B.R., Elkins, J.G., Guss, A.G., Westpheling, J., Davis, M.F., Dixon, R.A., Mohnen, D., Lynd, L.R., Tuskan, G.A. and Himmel, M.E. Understanding plant cell wall structure and properties during microbial deconstruction – from chemical bonds to wall morphology. DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, TN.

Bootpetch, T., Lin, Y.T, Che, M. and Wright, A.J. *Identifying UniformMu maize mutants that disrupt microtubule binding proteins*. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2016.

Chen, F. and Yang, B. (2016). High lignin content increase total energy and carbon sequestration of plant biomass. Southern Section of the American Society of Plant Biologists, Denton, TX. April 2016.

Chen, F., Zhuo, C., Rao, X., and Dixon, R.A. C-lignin biosynthesis and bioengineering in Cleome. DOE BioEnergy Science Center Annual Retreat --2016, Chattanooga, TN.

Delwel, I.O., Garcia, C., Bhuiyan, S., and Hughes, L.E. (2016). Comparative Analysis of *Streptomyces* Bacteriophages OlympicHelado and Rima. Texas Branch – ASM Spring Meeting, New Braunfels, TX. March-April 2016.

Dumitrache, A., Natzke, J., Rodrigues, M. Jr., Yee, K., Thompson, O.A., Poovaiah, C., Shen, H., Mazarei, M., Baxter, H., Engle, N., Fu, C., Wang, Z-Y., Biswal, A., Li, G., Tang, Y., Tschaplinski, T., Stewart, C.N. Jr., Dixon, R.A., Nelson, R., Mohnen, D., Mielenz, J., Brown, S., and Davison, B. Transgenic switchgrass (*Panicum virgatum L.*) with reduced recalcitrance to bioconversion: a two-year comparative analysis of five different types of transgenes in the field. DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, Tennessee.

Dzialowski, E.M., Sirsat, T.S., Sirsat, S.K.G., and Price, E.R. Ontogeny of breathing pattern and ventilatory chemosensitivity in altricial red-winged blackbird (Agelaius phoenixes) nestlings. Experimental Biology annual meeting, San Diego, CA. April 2016.

Escamilla-Trevino, L.L., Petranova, D., Ha, C.M., Barros-Rios, J., and Dixon, R.A. Unraveling pathway diversity for monolignol biosynthesis in plants. DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, Tennessee.

Fang Chen, Chunliu Zhuo, Xiaolan Rao, and Richard A. Dixon. C-Lignin Biosynthesis and Bioengineering in Cleome. DOE BioEnergy Science Center Annual Scientific Retreat-2016, Chattanooga, TN.

Flanagan, A., Escamilla-Trevino, L., Rao, X., Holladay, S., Biswal, A., Baxter, H., Engle, K., Mazarei, M., Nandety, A., Serba, D., Xie, H., Li, G., Fu, C., Tang, Y., Hardin, F., Saha, M., Stewart, N. Jr., Dixon, R.A., Mohnen, D., Gjersing, E., Dumitrache, A., Dowe, N., Nelson, R.S., and Wang, Z-Y. Switchgrass TOP lines in the greenhouse: morphological characteristics and current status of analyses. DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, Tennessee.

Gallego-Giraldo, L., Poce-Albacete, S., Pattathil, S., Hahn, M., Young, J., Westpheling, J., and Dixon, R.A. Lignin modification and its relation to pectin in the plant cell wall matrix. DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, Tennesse

Happs, R.M., Doeppke, C., Gallego-Giraldo, L., Dixon, R.A., and Davis, M.F. Analysis of in vivo ^{13}C-labeled transgenic alfalfa lignins. DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, Tennessee.

Gale, R.*, Sinharoy, S., Veerappan, V., and Dickstein, R. *Transcriptional control of vasculature development of Medicago truncatula nodules*. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2016. *Undergraduate Student.

Gallego-Giraldo, L., Poce-Albacete, S., Know, P., and Dixon, R.A. Understanding plant cell wall signals through lignin modification and its relation to plant defense responses. Southern Section of the American Society of Plant Biologists, Denton, Texas. April 2016

Ghaste, M., Astarita, G., Mattivi, F., Shulaev, V. (2016) Atmospheric pressure gas chromatography mass spectrometry (APGC-MS) based Metabolomics profiling of Grape Volatiles, The 64th ASMS Annual Conference on Mass Spectrometry and Allied Topics, San Antonio, TX. June 2016.

Ha, C.M. Escamilla-Trevino, L., Serrani-Yarce, J.C., Kim, H., Ralph, J. Chen, F., and Dixon, R.A. (2016). Role of caffeoyl shikimate esterase in monolignol biosynthesis. Southern Section of the American Society of Plant Biologists, Denton, Texas. April 2016.

Harkleroad, A., Chen, F., Rao, X., Nar, M., D'Souza, N., and Dixon, R.A. C-lignin: A linear lignin polymer. Southern Section of the American Society of Plant Biologists, Denton, Texas. April 2016

Hartman, R., McCown, C., and Hughes, L. Comparative Analysis of the Expanding *Streptomyces* BC Cluster. 2016 Howard Hughes Medical Institute SEA-PHAGES Symposium, Ashburn, VA.

Jun, J.H., Liu, C., Xiao, X., and Dixon, R.A. (2016). The transcriptional repressor MYB2 regulates both spatial and temporal patterns of proanthocyandin and anthocyanin pigmentation in *Medicago truncatula*. Southern Section of the American Society of Plant Biologists, Denton, Texas.

Layton, S.R., Bhuiyan, S., and Hughes, L.E. (2016). Alternative Staining for Electron Microscopy with Ytterbium Acetate. 2016 Howard Hughes Medical Institute SEA-PHAGES Symposium, Ashburn, VA.

Lecoultre, M.S., Ding, X.S., Biswal, A., Mohnen, D., Barros-Rios, J., Dixon, R.A., Tang, Y., and Nelson, R.S. (2016). Cell wall recalcitrance traits of TP17/TP18 genes analyzed through VIGS. DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, Tennessee.

Lu, N., Roldan, M., and Dixon, R.A. (2016). Identification and characterization of two TT2-like MYBs from tetraploid cotton, *Gossypium hirsutum*. Southern Section of the American Society of Plant Biologists, Denton, Texas.

Martinez-Bautista, N., and Burggren, W. W. *Parental dietary exposure to PAHs enhances survival of the F1 generation during waterborne exposures*. International Congress on the Biology of Fish, San Marcos, TX. June 2016.

McClendon, T.O., Quick, R.D., and Hughes, L.E. (2016). Genomic Comparison of Bacteriophages in Cluster BF. Texas Branch – ASM Spring Meeting, New Braunfels, TX. March-April 2016.

McClinchie, E.A., Cai, Y., Price, A.M., Mullen, R.T., Dyer, J.M., and Chapman, K.D. *Expression of Mus musculus fat storage-inducing transmembrane protein 2 (FIT2) in Nicotiana benthamiana and Arabidopsis thaliana promotes lipid droplet accumulation.* American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2016.

McCown, C., Bhuiyan, S., and Hughes, L. Isolation and Characterization of *Streptomyces* Bacteriophage OverAchiever. Texas Branch – ASM Spring Meeting, New Braunfels, TX. March-April 2016.

Miles, N., Lau, K., Weil, C., and Wright, A.J. *Microtubule defects in maize katanin mutants*. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2016.

Miles, N. and Wright, A.J. *A genetic screen to identify maize mutants with cell division defects*. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2016.

Pu, Y., Li, M., Chen, F., Dixon, R.A., and Ragauskas, A. *The fate of C-lignin in vanilla seeds during pretreatments*. DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, TN.

Raley, C., Rahal, A., Whitaker, P., Bhuiyan, S., and Hughes, L. Collection and Isolation of Phage Tinker. Texas Branch – ASM Spring Meeting, New Braunfels, TX. March-April 2016.

Rao, X., Chen, X., Shen, H., Ma, Q., Xu, Y., and Dixon, R.A. Co-expression analysis to identify transcriptional networks that *re*gulate secondary cell wall formation in switchgrass. DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, TN.

Salvachua, D., Notonier, S., Katahira, R., Black, B., Chen, F., Dixon, R.A., and Beckham, G.T. *Microbial conversion of C-lignin.* DOE BioEnergy Science Center Annual Meeting --2016, Chattanooga, TN

Sandra Notonier, Davinia Salvachúa, Rui Katahira, Brenna A. Black, Fang Chen, Richard A. Dixon, and Gregg T. Beckham Microbial Conversion of C-lignin. DOE BioEnergy Science Center Annual Scientific Retreat-2016, Chattanooga, TN.

Santiago, R., López-Malvar, A., Barros-Rios, J., and Malvar, R.A. Cell wall hydroxycinnamate cross-linkage in diverse parts of a corn plant. XIV Cell Wall Meeting, Creta, Greece.

Saxena, G., McQualter, R., and Dixon, R.A. (2016). Metabolic engineering of C*hlamydomonas reinhardtii* for production of p-hydroxybenzoic acid. Southern Section of the American Society of Plant Biologists, Denton, TX. April 2016.

Serrani-Yarce, J.C., Barros-Rios, J., and Dixon, R.A. (2016). *Assessment of the early lignin pathway in Brachypodium distachyon*. Southern Section of the American Society of Plant Biologists, Denton, TX. April 2016.

Serrani-Yarce, J.C., Barros-Rios, J., and Dixon, R.A. (2016). *Assessment of the early lignin pathway in brachypodium distachyon.* DOE BioEnergy Science Center Annual Meeting –2016, Chattanooga, TN.

Shaikh, M.A., and Ayre, B. G. *Understanding the crosstalk between carbohydrate transport and phosphate use in plants with enhanced phloem partitioning from source to sink.* Federation of North Texas Area Universities 7th Annual Federation Research Symposium, Denton, TX. April 2016.

Shao, D. and Wright, A.J. *The calcium binding properties of TON2, a protein needed for preprophase band formation in plants*. American Society of Plant Biologists-Southern Section meeting, Denton, TX. April 2016.

Sivoravong, A., Bhuiyan, S., Nayek, S., and Hughes, L.E. Discovery, characteristics, and basic genomic analysis of bacteriophage papaya salad. Texas Branch – ASM Spring Meeting, New Braunfels. TX, March-April 2016.

Standridge, C., Layton, S.R., Bhuiyan, S., and Hughes, L.E. Isolation and purification of bacteriophage tompkins. Texas Branch – ASM Spring Meeting, New Braunfels, TX. March-April, 2016.

Sturtevant, D., Dueñas M.E., Lee, Y.-J., and Chapman, K.D. *Three-dimensional visualization of membrane phospholipid heterogeneity in Arabidopsis thaliana seeds by MALDI-MS imaging*. American Society for Mass Spectrometry Conference, San Antonio, TX. June 2016.

Wang, X., Shao, H., Li, L., Modolo, L., Escamilla-Trevino, L., He, X., Wu, B., Adhikari, B., Almalki, F. Dixon, R.A., and Hu, M. *Structure and engineering of plant natural product UGTs.* Southern Section of the American Society of Plant Biologists, Denton, TX. April 2016

Xie, M., Bryan, A.C., Yee, K., Guo, H-B., Tschaplinski, T.J., Singan, V.R., Lindquist, E., Payyavula, R.S., Barros-Rios, J., Dixon, R.A., Engle, N., Sykes, R.W., Jawdy, S., Gunter, L.E., Thompson, O., DiFazio, S.P., Eveans, L.M., Winkler, K., Collins, C., Schmutz, J., Guo, H., Kalluri, U., Modriguez, M. Feng, K., Muchero, W., Chen, J-G., and Tuskan, G.A. *A shikimate EPSP synthase gene evolved transcriptional repressor function in Populus.* DOE BioEnergy Science Center Annual Retreat --2016, Chattanooga, TN.

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