A green light to greatness.™

DEPARTMENT OF BIOLOGICAL SCIENCES
UNIVERSITY OF NORTH TEXAS

# BIOsphere

2014

Issue 1

## Awards and Recognitions

The Department of Biological Sciences was named '**2014 Department of the Year**' by The Eagle Feather, A Publication for Undergraduate Scholars. https://eaglefeather.honors.unt.edu

Drs. Richard Dixon and Ron Mittler

**Dr. Richard Dixon**, University Distinguished Research Professor, and **Dr. Ron Mittler**, Professor in Biological Sciences, were named Thompson Reuter 2014 Highly Cited Researcher.

Congratulations to **Dr. Amanda Wright**, Assistant Professor in Biological Sciences, on being awarded National Science Foundation's CAREER award, which is the foundations most prestigious award to junior faculty, and to **Dr. Lee Hughes**, Associate Professor in Biological Sciences, on his nomination as UNT's US Professor of the Year.

Drs. Amanda Wright and Lee Hughes

Alexis Wormington and Anastacia Garcia

Kudos to **Alexis Wormington**, a junior at UNT who is conducting research in Associate Professor Dr. Aaron Robert's lab, on receiving a US Environmental Protection Agency Greater Research Opportunities undergraduate fellowship to further her research on how aquatic ecosystems are affected by nanoparticles. She is one of only about 30 undergraduate students in the U.S. awarded this fellowship, which will provide her $20,700 in academic support per year for two years. http://news.unt.edu/news-releases/unt-biology-student-earns-prestigious-us-epa-research-fellowship)

Congratulations to **Anastacia (Tasha) Garcia**, graduate student in Associate Professor Dr. Pamela Padilla's lab, who was awarded the Thesis and Dissertation Fellowship by UNT Toulouse Graduate School. This award supports outstanding students during their last year of the graduate program. She was one of 18 students on campus selected for this award.

**Jennifer Jung**, undergraduate researcher in Associate Professor Dr. Ed Dzialowski's lab, received a competitive abstract based travel award to attend the American Physiological Society Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology in San Diego. Her poster was placed 2nd in the undergraduate best poster competition. Way to go, Jennifer.

## Promotion and Tenure

Congratulations to **Drs. Dane Crossley, Qunfeng Dong** and **Jeff Johnson** for Promotion to Associate Professor with Tenure, and to **Dr. Jaime Jimenez**, Professor in Biological Sciences, for being awarded Tenure.

## Thesis/Dissertation

**Susan Hammerly** successfully completed her Ph.D. degree with a dissertation entitled '*The effects of inbreeding on fitness traits in the critically endangered Attwater's Prairie-chicken'*. Dr. Jeff Johnson, Associate Professor in Biological Sciences was her advisor. She is continuing her research as a postdoc in Dr. Johnson's lab.

**Ying-Sheng Huang** completed his M.S. degree with a thesis entitled '*Evidence for multiple functions of a Medicago truncatula transporter*'. Dr. Rebecca Dickstein, Professor in Biological Sciences was his advisor.

## Other News

The U.S. Army Corps of Engineers established the Environmental Advisory Board (EAB) in 1970, as a means for Headquarters to gain outside, expert and independent advice on environmental issues facing the Corps of Engineers. The EAB, which advises the Chief of Engineers, consists of 10 members selected by the Secretary of Defense, based on nationally recognized expertise. **Dr. Sam Atkinson**, Professor in Biological Sciences, was named Vice Chair of the EAB. The EAB is currently formulating multiple opinions ranging from changes in water resource management strategies in the face of increasingly variable severe weather, to prioritizing criteria that the Corps could use in selecting ecosystem restoration projects that should be funded, to dealing with the nation's aging dams, levies, coastal storm walls and other related infrastructure.

Lieutenant General Tom Bostick, Chief of Engineers, U.S. Army Corps of Engineers and Dr. Sam Atkinson, Vice Chair of the Corps' Environmental Advisory Board.

**Dr. Richard Dixon**, University Distinguished Research Professor, was named President-Elect, American Society of Plant Biologists, 2014. He was also appointed to the US National Research Council Panel on Genetically Engineered Crops, and named Member of the Scientific Advisory Board for Forage Genetics International.

**Dr. Nicoladie Tam**, Associate Professor in Biological Sciences, was named Director-elect, Organization for Computational Neuroscience.

**Dr. Amie Lund**, Assistant Professor in Biological Science's research and international collaborations were featured in an article published in The New York Times. http://www.nytimes.com/2014/07/21/us/us-seen-as-weak-on-global-research-collaboration.html?_r=3

**Dr. Brian Ayre**, Associate Professor in Biological Science, was elected ***Faculty Senator*** representing Group VII. He was also elected to the Executive Committee of the Faculty Senate.

**Zane Gibbs** (mentor: Lee Hughes) and **Son Le** (mentor: Guenter Gross), UNT undergrads from the Department of Biological Sciences, completed summer research placements in the Howard Hughes Medical Institute's Exceptional Research Opportunities Program (ExROP). https://news.unt.edu/news-releases/unt-students-earn-national-research-placement

**Aaron Chao** (mentor: Dr. Jyoti Shah), **Justin Du** (mentors: Dr. Jannon Fuchs and Marco Coronell), **Joanne Shang** (mentor: Dr. Jannon Fuchs), **Franklin Zhang** (mentor: Dr. Jannon Fuchs), and **Thomas Yu** (mentor: Dr. Jannon Fuchs), all TAMS students in the Department of Biological Sciences, were semifinalists in the Siemens Competition in Math, Science & Technology.

## Outreach Activities

In September and Octobber, 5th graders from Hodge Elementary, Thomas Rivera Elementary and Adkins Elementary schools were hosted by Drs. Jyoti Shah and Brian Ayre during their visit to the Department of Biological Sciences to learn about Plant Sciences research at UNT and its contribution to sustainability. These trips were organized by UNT sustainability.

5th graders on a UNT sustainability tour of Plant Sciences

Dr. Rebecca Dickstein, Associate Professor in Biological Sciences, authored the article "Little bluestem adds color" for the Denton Record-Chronicle, October 17, 2014. http://www.dentonrc.com/living-in-denton/home-garden/home-garden-headlines/20141017-becca-dickstein-native-roots.ece

The Birdwell and Clark Ranch in Henrietta, Texas, was honored by UNT Quail with the inaugural Keystone Ranch Award for wildlife sustainability and sustainable grazing practices. http://news.unt.edu/news-releases/unt-quail-honorsbirdwell-and-clark-ranch-henrietta-texas-inaugural-keystone-ranch-awa

## New Faculty/Staff Appointments and Visiting Scientists

**Dr. Yong Ji** is visiting the Environmental Science Division from China. Dr. Ji is an Assistant Professor from the Nanchang Institute of Technology (NIT) located in Nanchang City, Jiangxi Province, Middle-eastern China. His year-long stay is being funded by NIT and the China Scholarship Council. Dr. Ji's research interests are in the areas of water pollution and biomarkers for effects of heavy metal exposure. He is working with Dr. Venables, Professor in Biological Sciences.

**Dr. Edwin Price** joined Dr. Ed. Dzialowski's lab as a post-doc. Dr. Price received his Ph.D. from University of Western Ontario. Prior to joining UNT, he was a post-doc at University of Wisconsin.

## Recent Publications


Plant Journal, Vol. 79
Blancaflor et al. 2014
Shah et al. 2014

Blancaflor, E.B., Kilaru, A., Keereetaweep, J., Khan, B.R., Faure, L., and Chapman, K.D. (2014) *N*-Acylethanolamines: lipid metabolites with functions in plant growth and development. *Plant Journal* 79:568-583. *Special issue on Small Molecules in Signaling* (***Cover of Issue***)

Blumberg, J.B., Ding, E.L., Dixon, R.A., Pasinetti, G.M. and Villarreal, F. (2014) The science of cocoa flavanols: bioavailability, emerging evidence and proposed mechanisms. *Advances in Nutrition* 5: 547-549.

Burnham, K.K., Sinnett, D.R., Johnson, J.A., Burnham, J.L., Baroch, J., and Konkel, B.W. (2014) New species records and changes in abundance of waterfowl in northwest Greenland. *Polar Biology* 37:1289-1300.

Dzialowski, E.M., Tattersall, G.J., Nicol, S.C., and Frappell, P.B. (2014) Fluctuations in oxygen influence facultative endothermy in bumblebees. *Journal of Experimental Biology* 217: 3834-3842. This article was featured in the Inside JEB section of the journal. http://jeb.biologists.org/content/217/21/3768.full

Fuchs, J., Johnson, J.A., and Mindell, D.P. (2015) Rapid diversification of falcons (Aves: Falconidae) due to expansion of open habitats in the Late Miocene. *Molecular Phylogenetics and Evolution* 82:166-182.

Horn, P.J., and Chapman, K.D. (2014) Lipidomics in situ: Insights into Plant Lipid Metabolism from High Resolution Spatial Maps of Metabolites. *Progress in Lipid Research* 54:32-52.

Ishtiaq, F., Prakash, V., Green, R.E., and Johnson, J.A. (2014) Management implications of genetic studies for ex situ populations of three critically endangered Asian *Gyps* vultures. *Animal Conservation*. DOI: 10.1111/acv.12166

Jagadeeswaran, P. (2014) Zinc fingers poke zebrafish, cause thrombosis! *Blood*, 124:9-10.

Kim, S., Sundaramoorthi, H., and Jagadeeswaran, P. (2014) Dioxin-induced thrombocyte aggregation in zebrafish. *Blood Cells Mol Dis*. doi: 10.1016/j.bcmd.2014.07.010. Epub 2014 Aug 14.

Libault, M. and Dickstein, R. (2014) Advances in Functional Genomics Research in Legumes. In '*Legumes in the 'Omic Era*', Springer New York (Gupta, S., Nadarajan, N., Gupta, D. S. eds. ISBN 978-1-4614-8369-4) pp 15-39.

Lifschitz, E., Ayre, B.G., and Eshed, Y. (2014) Florigen and anti-florigen – a systemic mechanism for coordinating growth and termination in flowering plants. *Frontiers in Plant Science*. 5:465. doi: 10.3389/fpls.2014.00465

Liu, C., Jun, J and Dixon, R.A. (2014) MYB5 and MYB14 play pivotal roles in seed coat polymer biosynthesis in *Medicago truncatula*. *Plant Physiology*. 19:1424-1439.

Louis, J., and Shah, J. (2014) Plant defense against aphids: The *PAD4* signaling nexus. *Journal of Experimental Botany*. doi: 10.1093/jxb/eru454

Mauderly, J.L., Kracko, D., Brower, J., Doyle-Eisele, M., McDonald, J.D., Lund, A.K., Seilkop, S.K. (2014) The National Environmental Respiratory Center (NERC) experiment in multi-pollutant air quality health research: IV. Vascular effects of repeated inhalation exposure to a mixture of five inorganic gases. *Inhalation Toxicology* 26:691-696.

Mauderly, J.L., Barrett, E.G., Day, K.C., Gigliotti, A.P., McDonald, J.D., Harrod, K.S., Lund, A.K., Reed, M.D., Seagrave, J.C., Campen, M.J., Seilkop, S.K. (2014) The National Environmental Respiratory Center (NERC) experiment in multi-pollutant air quality health research: II. Comparison of responses to diesel and gasoline engine exhausts, hardwood smoke and simulated downwind coal emissions. *Inhalation Toxicology* 26:651-667.

Pan, H., Zhou, R., Gordon V. Louie, G.V., Mühlemann, J.K., Bomati, E.K., Bowman, M.E., Dudareva, N., Dixon, R.A., Noel, J.P. and Wang, X. (2014) Structural studies of cinnamoyl-CoA reductase and cinnamyl-alcohol dehydrogenase, key enzymes of monolignol biosynthesis. Plant Cell 26:3709-3727.

Ragauskas, A.J., Beckham, G.T., Biddy, M.J., Chandra, R., Chen, F., Davis, M.F., Davison, B.H., Dixon, R.A., Gilna, P., Keller, M., Langan, P., Naskar, A.K., Saddler, J.N., Tschaplinski, T.J., Tuskan, G.A., Wyman, C.E. (2014) Lignin valorization: improving lignin processing in the biorefinery. *Science* 344:1246843. doi: 10.1126/science.1246843

Rao, X., Krom, N., Tang, Y., Widiez, T., Havkin-Frenkel, D., Belanger, F.C., Dixon, R.A. and Chen, F. (2014) A deep transcriptomic analysis of pod development in the vanilla orchid (*Vanilla planifolia*). *BMC Genomics* 15:964. doi:10.1186/1471-2164-15-964

Schulwitz, S., Bedrosian, B., and Johnson, J.A. (2014) Low neutral genetic diversity in an isolated greater sage-grouse (*Centrocercus urophasianus*) population in northwest Wyoming. *The Condor* 116: 560-573. (***Cover of Issue***)

The Condor, Vol. 116
Schulwitz et al. 2014

Shah, J. (2014) Lipases in signalling plant defense responses. In Phospholipases in Plant Signaling. *Signaling and Communication in Plants* (Wang, X. ed). Springer Verlag: 20:207-228.

Shah, J., Chaturvedi, R., Chowdhury, Z., Venables, B., Petros, R. A. (2014) Signaling by small metabolites in systemic acquired resistance. *Plant Journal* 79:645-658. (***Cover of Issue***; see Blancaflor et al. 2014 above)

Sundaramoorthi, H., Khandekar, G., Kim, S., Jagadeeswaran, P. (2014) Knockdown of alphaIIb by RNA degradation by delivering deoxyoligonucleotides piggybacked with control vivo-morpholinos into zebrafish thrombocytes. *Blood Cells Mol Dis*. doi: 10.1016/j.bcmd.2014.07.016. Epub 2014 Aug 15.

Tam, N.D. (2014) Hexagonal pixel-array for efficient spatial computation for motion-detection pre-processing of visual scenes. *Advances in Image and Video Processing* 2:26-36.

Tam, N.D. (2014) Quantification of happy emotion: Proportionality relationship to gain/loss. *Psychology and Behavioral Sciences* 3:60-67.

Tam, N.D. (2014) Quantification of happy emotion: Dependence on decisions. *Psychology and Behavioral Sciences* 3:68-74.

Tam, N.D. (2014) Reduction of student's exam grade performance when spending more time in an exam. *British Journal of Education, Society and Behavioural Science* 4:1125-1139.

Tam, N.D. (2014) Quantification of fairness perception by including other-regarding concerns using a relativistic fairness-equity model. *Advances in Social Sciences Research Journal*. 1:159-168.

Tam, N.D. (2014) Quantification of fairness bias in relation to decisions using a relativistic fairness-equity model. *Advances in Social Sciences Research Journal*. 1:169-178.

Tam, N.D., and Zouridakis, G. (2014) Temporal decoupling of oxy- and deoxy-hemoglobin hemodynamic responses detected by functional near-infrared spectroscopy (fNIRS). *Journal of Biomedical Engineering and Medical Imaging* 1:18-28.

Tam, N.D.., and Zouridakis, G. (2014) Decoding movement direction from motor cortex recordings using near-infrared spectroscopy Infrared Spectroscopy: Theory, Developments and Applications. Hauppauge, NY: Nova Science Publishers, Inc.

Vu, H. S., Shiva, S., Roth, M. R., Tamura, P., Zheng, L., Li, M., Sarowar, S., Honey, S., McElhiney, D., Hinkes, P., Seib, L., William T. D., Gadbury, G., Wang, X., Shah, J., and Welti, R. (2014) Lipid changes after leaf wounding in *Arabidopsis thaliana*: Expanded lipidomic data form the basis for lipid co-occurrence analysis. *Plant Journal* 80:728-743.

*Wu, X., *Wu, F.H., *Wang, X., Wang, L., Siedow, J.N., Zhang, W., Pei, Z.M. (2014) Molecular evolutionary and structural analysis of the cytosolic DNA sensor cGAS and STING. *Nucleic Acids Research*. 42: 8243-8257. (*Joint first authors)

Zhao, Q., Zeng, Y., Yin, Y., Pu, Y., Jackson, L.A., Engle, N.L., Martin, M.Z., Tschaplinski, T.J., Ding, S-Y., Ragauskas, A.J. and Dixon, R.A. (2014) Pinoresinol reductase 1 impacts lignin distribution during secondary cell wall biosynthesis in Arabidopsis. *Phytochemistry*. doi: 10.1016/j.phytochem.2014.07.008. [Epub ahead of print]

## Patent Issued

Plant isoflavone and isoflavone O-methyltransferase genes. B.E. Broeckling, C.-J. Liu and R.A. Dixon. U.S. patent number 8,809,627 B2, August 19, 2014.

## Extramural Grants and Contracts

Aquatic ecosystem restoration research and development for Lake Austin, Texas. U.S. Army Corps of Engineers and City of Austin. PIs – Atkinson (UNT) and Dick (Corps of Engineers); Co-PIs – Dodd (Corps of Engineers) and Smith (UNT), $645,000

Aquatic ecosystem restoration research and development for Lake Conroe, Texas, U.S. Army Corps of Engineers and San Jacinto River Authority, PIs – Atkinson and Dick (Corps of Engineers); Co-PIs – Dodd (Corps of Engineers) and Smith (UNT), $73,500

Aquatic ecosystem restoration research and development for the Dallas Trinity River Corridor, Texas, U.S. Army Corps of Engineers and Trinity Commons Foundation, PIs – Atkinson and Dick (Corps of Engineers); Co-PIs – Dodd (Corps of Engineers) and Smith (UNT), $75,500

Aquatic ecosystem restoration research and development for the West Fork of the Trinity River, City of Grand Prairie Texas, PI – Atkinson, $220,000

Bioenergy Sciences Center (Switchgrass Research), US-DOE (Bioenergy Sciences Center). PI: Dixon, $849,801

CAREER: Genetic approach to identifying proteins necessary for division plane orientation during plant development. National Science Foundation. PI: Wright, $588,844

Collaborative Research: Characterization and modeling of natural fiber polymer matrix composites for correlating natural fiber/matrix morphology. National Science Foundation, Division of Civil, Mechanical, and Manufacturing Innovation. PI: D'Souza; Co-PI: Ayre, $374,723

Collaborative Research: Integrating two different roles of the proton-pumping pyrophosphatase in the regulation and efficiency of carbon utilization and transport in planta. National Science Foundation. Lead PI: Gaxiola (Arizona State University); UNT PI: Ayre, Co-PI: Shulaev, $760,000

Collaborative Research: Lipidomic profiling, dynamics, and functions of head-group acylation of membrane lipids in plant stress responses. National Science Foundation. PI at UNT: Shah, $75,000. Other institutes involved in this Collaborative research include Kansas State University, University of Missouri-St. Louis, and Iowa State University

Collaborative Research: Metabolomic profiling and functions of oxidized membrane lipids in plant stress responses. National Science Foundation. PI at UNT: Shah, $406,452. Other institutes involved in this Collaborative research include Kansas State University, and University of Missouri-St. Louis

Collaborative Research: Putative nitrate transporter regulates symbiotic nodule development. National Science Foundation. PI at UNT: Dickstein; PI at University Delaware: Sherrier, $1,081,873

Deciphering proanthocyanidin biosynthesis in alfalfa. US Department of Agriculture. PI: Dixon, $336,063

Dehydroabietinal signaling in plant defense. National Science Foundation. PI: Shah; Co-PIs: Venables and Petros, $299,999

Developmental co-dependence and embryonic programming of cardiac and renal systems function in vertebrates – II. National Science Foundation. PI: Burggren, $806,255

Energy plant design. US-DOE ARPA-e. PI: Liao (UCLA); Co-PI: Dixon (UNT), $250,000

Engineering neutral lipid accumulation in vegetative tissues of plants. U.S. Department of Energy. PI: Chapman (Co-PI: Mullen (Canada), Dyer (USDA), $600,000

Expanding application of proteomics-based research in archaeological residue analysis. National Science Foundation. PI: Wolverton Co-PI: Barney Venables; Collaborator: Stevens (Univ South Florida), $114,924

Fishery Habitat Restoration: Establishing native aquatic vegetation in Texas Parks and Wildlife Department-managed lakes. Texas Parks and Wildlife. PI – Atkinson (UNT); Co-PI with Dick and Dodd (Corps of Engineers), $20,000

Fostering Outstanding Cohorts in Undergraduate Science (FOCUS) II. National Science Foundation. PI: Hughes; Co-PIs: Wilson (Chemistry), Padilla (Biology), Gao (Mathematics), Philipose (Physics), $625,235.

GEPR: Genetic and cellular dissection of mutualistic plant-microbe symbioses in *Medicago truncatula*. PI: Udvardi (S.R. Noble Foundation); Other co-PIs: Dickstein (UNT), Chen and Mysore (S. R. Noble Foundation), Harrison (Boyce Thompson Institute for Plant Research), Sherrier (University of Delaware), $6,683,108

Genetic manipulation of cottonseed protein reserves. Cotton Incorporated. PI: Chapman, $595,000

Intergovernmental Personnel Act Agreement for Dr. Dian Smith. U.S. Army Corps of Engineers. PI – Atkinson, $80,337

Metabolomics: Advancing the scientific promise of metabolomics to better understand plant specialized metabolism. National Science Foundation. PI: Sumner (S.R. Noble Foundation); Co-PI: Dixon (UNT), $505,653

Mitigation benefits: making a difference with strategic inter-resource agency panning, Texas Department of Transportation, PI – Overman (Texas A&M); Co-PI – Atkinson), $292,254

MRI: Acquisition of a LSM710 laser scanning confocal microscope to enhance plant research and training at the University of North Texas. National Science Foundation. PI: Shah; Co-PI's: Ayre, Dickstein, Wright. $377,290

MRI: CloudCar: Development of a diverse distributed instrument for vehicles in the cloud", National Science Foundation. PI: Dantu (Engineering); Co-PI: Tam (Biological Sciences), $500,000

Molecular approaches to improved protein utilization in alfalfa. Forage Genetics International. PI: Dixon, $750,000

Monitoring of bumble bee (Bombus spp.) abundance and richness in Denton County Urban Green Spaces, Texas Parks and Wildlife, PI – Atkinson, $22,027

*N*-Acylethanolamine (NAE) metabolism and the acquisition of photoautotrophy during seedling establishment. U.S. Department of Energy. PI: Chapman; Co-PI: Blancaflor (S.R. Noble Foundation), $360,000

Ontogeny of endothermy's cellular furnace. National Science Foundation. PI: Dzialowski. $785,596.

Plant-based sesquiterpene biofuels. Chromatin, Inc. (DOE-APRAe). PI: Brumbley; Co-PI's: Dixon and Chen, $910,743

Protective roles of grape-derived polyphenols in Alzheimer's disease: Administrative Supplement. NCCAM (National Institute Health), PI: Dixon, $322,672

Regulation of growth habit in complex sympodial plants: Applying the tomato model to cotton. Bi-national Agricultural Research Development (BARD) Fund. PI: Ayre; Co-PI: Lifschitz (Israel Inst Tech), Yuval (Weizmann Inst), Chapman (UNT), $310,000

Regulation of neutral lipid metabolism in plants - Support for DOE Project GF2600. USDA Agricultural Research Service. PI: Chapman, $20,331

Role of the *Arabidopsis thaliana TPS11* gene and trehalose metabolism in defense against green peach aphid. National Science Foundation. PI: Shah, $652,000

Targeting Host defense mechanism for enhancing FHB resistance in wheat. US Department Agriculture. PI: Shah; Co-PI: Trick (Kansas State University), $106,088

Undergraduate Science Education 2010- Core Proposal. Howard Hughes Medical Institute. PI: Hughes; Co-PIs: Allen, Benjamin, Burleson, Chapman, Dzialowski, Thompson, $1,300,000

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: Ayre, $285,000

UNT Science and Mathematics Robert Noyce Scholarships. National Science Foundation. PI: Eddy (Secondary Education); Co-PI: Harrell (Secondary Education), Hughes (Biological Sciences), Quintanilla (Mathematics), $749,965

Use of single nucleotide polymorphisms (SNPs) for reconstructing the Attwater's Prairie-chicken captive population pedigree. U.S. Fish & Wildlife Service Research Grant. PI: Jeff Johnson, $53,200

## Invited Seminars

Arabidopsis homologues of the human lipodystrophy protein, SEIPIN, influence the size and number of lipid droplets. International Symposium on Plant Lipids, Storage Lipids Session, Guelph, Ontario, Canada, July 7, 2014. Invited talk by Dr. Kent Chapman. Co-authors, Yingqi Cai (Ph.D. Student) J. Dyer and R. Mullen.

Development of endothermy in altricial and precocial birds. APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology, San Diego. 2014. Talk by Dr. Ed Dzialowski. Co-authors E.M., S.G. Sirsat, and T.S. Sirsat.

Effect of thyroid hormone manipulation on endthermic development in Double-Crested Cormorants (*Phalacrocorax auritus*). APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology, San Diego. 2014. Talk by Tushar Sirsat. Co-authors: S.G. Sirsat, M. Pineda and E.M. Dzialowski.

Evidence of hypoxic metabolic programming in developing alligator hearts. APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology, San Diego. 2014. Talk by G.L.J, Galli. Co-authors: E. Ruth, E.M. Dzialowski, H.A. Shiels, and D.A. Crossley.

Genetics and serendipity—insights into lignin polymerization and natural variability. Lignin 2014 conference in Umeå, Sweden, August 24-28, 2014. Invited talk by Dr. Richard Dixon.

Food in a crowded planet – the importance of nitrogen. UNT Speaks Out on Food Day: Vegetarianism. UNT Willis Library, October 22, 2014. Invited talk by Dr. Rebecca Dickstein.

From defense to cell walls and back again. Phytochemical Society of North America in Raleigh, NC, August 9-13, 2014. Plenary talk by Dr. Richard Dixon. He also spoke at the PSNA Young Member luncheon.

Macrophages and Mercury: Implications for Fish and Wildlife Health. Department of Biology, University of Tennessee-Chattanooga. October 2014. Invited seminar by AP Roberts.

Photoinduced toxicity of PAH following an oil spill: Implications for early lifestage organisms. Asia-Pacific Society of Environmental Toxicology and Chemistry meeting, Adelaide, SA, Australia Sept 2014. Talk by Dr. Aaron Roberts. Co-authors: MM Alloy, and JT Oris.

Photoinduced toxicity of PAH following an oil spill: Implications for early lifestage organisms. Department of Biology, Texas Christian University. October 2014. Invited seminar by AP Roberts.

Plant defense against the polyphagous green peach aphid. 2nd International Hemipteran-Plant Interactions Symposium, Riverside, CA, June 22-25, 2014. Plenary talk by Dr. Jyoti Shah.

Rapid diversification of falcons (Aves: Falconidae) due to expansion of open habitats in the Late Miocene. Raptor Research Foundation Conference. 24-28 September, 2014, Corpus Christi, TX. Invited Lecture by Dr. Jeff Johnson. Co-authors: K. Fuchs, and D. P. Mindell.

The phloem network as a whole-plant integrator of developmental signals and nutrient homeostasis: Applications for breeding and crop productivity. Oklahoma State University, Botany Department, September 24th, 2014. Invited seminar by Dr. Brian Ayre.

Use of CYP1A1 as a biomarker following oil spills. Asia-Pacific Society of Environmental Toxicology and Chemistry meeting, Adelaide, SA, Australia Sept 2014. Talk by Dr. Aaron Roberts. Co-author: JT Oris.

## Conference Presentations

Chen, F. (2014). The diversity of natural lignins, Lignin 2014 conference, Umeå, Sweden.

Chowdhury, Z., Chaturvedi, R., Venables, B., Petros, R., Chao, A., and Shah, J. (2014). Dehydroabietinal signaling in systemic acquired resistance and flowering. Plant Biology 2014, American Society of Plant Biologists annual meeting, Portland, OR.

Jung, J., Sirsat, T.S., and Dzialowski, E.M. (2014). Developmental Changes in mRNA Levels of avANT and PGC-1α in Duck Liver and Heart. APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology, San Diego. *2nd Place Best Undergraduate Poster at 2014 APS Comparative Meeting

Louis, J., Mondal, H.A., Lorenc-Kukula, K., and Shah, J. (2014). Knowledge gained from Arabidopsis-aphid interactions: How can we link to other plant-insect systems? Botany 2014: Symposium - Life after *Arabidopsis thaliana*: Using non-model organisms to understand species interactions, Boise, ID.

Mascarenhas, F. and Dzialowski, E.M. (2014). Developmental physiology of the Pekin duck (*Anas pekin*) ductus arteriosus. APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology, San Diego.

Mondal, H.A., Louis, J., Nalam, VJ, Sivapalan, V., Root DR, Shah J. (2014). Controlling aphid feeding from sieve elements: role of actin depolymerization. Plant Biology 2014, American Society of Plant Biologists annual meeting, Portland, OR.

Pineda, M., Sirsat, S., Sirsat, T., and Dzialowski, E. (2014). Thyroid Hormone and Development of Endothermy in King Quail. APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology, San Diego.

Rao, X., Adolfo, L., He, X., Tang, Y., and Dixon, R.A. (2014). De novo transcriptomes analysis in Kudzu roots for gene discovery in isoflavone biosynthesis, 53rd annual meeting of the Phytochemical Society of North America (PSNA)

Sarowar, S., Louis, J., Lorenc-Kukula, K., Keereetaweep, J., Welti, R., and Shah, J. (2014). The MYZUS PERSICAE-INDUCED LIPASE1 gene functions in oxylipin metabolism and plant response to biotic stress. Plant Biology 2014, American Society of Plant Biologists annual meeting, Portland, OR.

Sirsat, S.G., Sirsat, T.S., Pineda, M., Dzialowski, E.M. (2014). The role of T3 in development of endothermy in the altricial Red-winged Blackbird (*Agelaius phoeniceus*). APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology, San Diego.

Tam, N.D. (2014). Optical imaging of prefrontal cortex hemodynamic response in executive function induced by increased cardiovascular activity. BMC Neuroscience. 15(Suppl 1):P34 doi:10.1186/1471-2202-15-S1-P34.

Tam, N.D. (2014). Computational optimization problems in social interaction and empathic social emotion. BMC Neuroscience. 15(Suppl 1):P35 doi:10.1186/1471-2202-15-S1-P35.

Welti, R., Vu, H., Shiva, S., Roth, M., Tamura, P., Li, M., Sarowar, S., Gadbury, G., Wang, X., and Shah, J. (2014). Using lipidomics to probe lipid metabolism.Mass Spectrometry and Targeted Proteomics Symposium, Columbia, MO.