



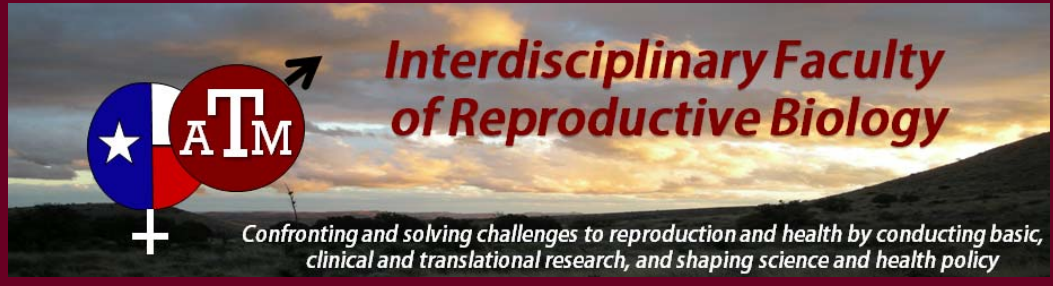
IFRB 2016

POINTS OF INTEREST:

- The IFRB was organized in 1992 and is one of the largest Reproductive Biology Programs in the US
- Membership includes 43 faculty from 5 departments, 3 colleges, 4 TAMUS components and 2 state agencies
- IFRB sponsored activities: 22nd Annual R.O. Berry Lecture, 24 year old IFRB Repro Forum Seminar Series, 22nd Texas Forum on Reproductive Sciences, Annual IFRB Retreat

INSIDE THIS ISSUE:

New IFRB Faculty Spotlight	1
IFRB Member Spotlight	3
IFRB Seminar Series	5
Trainee News	6
Snapshot of IFRB Research	7
23rd R.O. Berry Memorial Lecture	9
10th Annual IFRB Retreat	11
Faculty Activities	12
Trainee Spotlight	18
SSR 2016	20



2016, ISSUE 1

New IFRB Faculty Spotlight



Dr. Brett Mitchell, an Associate Professor in the Department of Medical Physiology in the College of Medicine, recently became a new member of the IFRB. One area of his research program is preeclampsia and specifically, how the innate immune system



affects blood pressure regulation during pregnancy and how this becomes aberrant in preeclampsia. The objective is to develop therapeutics that reduce the severity of preeclampsia and safely prolong pregnancies.

Dr. Mitchell obtained his PhD from the Medical

College of Georgia and after a brief stint with Universities Space Research Association located at NASA's Johnson Space Center, he then joined the faculty at Baylor College of Medicine in the Department of Molecular Physiology and Biophysics. In July of 2007, he joined the faculty at Texas A&M Health Science Center in Temple, TX and then relocated his laboratory to the 3rd floor of the Reynolds Medical Building in College Station in 2015.

Preeclampsia, which affects 6-8% of all pregnancies, is the leading cause of maternal and fetal morbidity and mortality as well as premature births. He postulated that some women's innate immune system becomes abnormally over-activated during pregnancy due to a variety of reasons (i.e., viral infections, autoimmune disease, abnormal placental development) which manifests clinically as hypertension, proteinuria, and/or end-organ damage-the clinical diagnosis of preeclampsia. To test this, his group performed experiments in which they injected viral mimetics (RNA) into rodents and discovered that this induced preeclampsia-like features, but only if the animals were pregnant. They have since used these animal models of preeclampsia to not only examine the innate immune system during pregnancy but also test various therapeutics.

(continued on page 2)

Dr. Dr. Rodolfo Cardoso is an Assistant Professor and a member of the graduate faculty in the Physiology of Reproduction section of the Department of Animal Science and a new faculty member of the Interdisciplinary Faculty of Reproductive Biology.

Dr. Cardoso's research program focuses on better understanding the impact of the prenatal and early postnatal environments on reproductive neuroendocrine function in females using cattle and sheep as animal models to benefit both the livestock industry as well as human reproductive health.

He received a D.V.M. in 2005 and completed a residency program in Veterinary Theriogenology in 2007 at the Sao Paulo State University (Brazil). In 2009, he received a Master's degree in Animal Reproduction from the same institution. Subsequently, Dr. Cardoso obtained his Doctoral degree in Physiology of Reproduction in 2014 from Texas A&M University under the mentorship of **Drs. Gary Williams and Marcel Amstalden.** He then and completed a postdoctoral fellowship in Reproductive Endocrinology in 2016 at the University of Michigan under the mentorship of Dr. Vasantha Padmanabhan. An important line of research in the Cardoso laboratory at Texas A&M investigates the effects of nutrition during perinatal development on reproductive maturation in females. Timing of puberty in females has an important impact on reproductive efficiency and profitability of livestock production. Additionally, from a human health perspective, obesity during early childhood is associated with increased risk of precocious puberty in girls, which is a risk factor for reproductive cancers and fertility issues during adulthood. Using ruminant females and in collaboration with the Williams/Amstalden group,

(continued on page 4)





New Faculty, Brett Mitchell (cont'd from page 1)

Texas Forum for Reproductive Sciences (TFRS)



SAVE THE DATE

The Twenty-Third TFRS meeting will be held on April 27-28, 2017 at the MD Anderson Onstead Auditorium, 6550 Bertner, Houston, TX 77030; Social/Dinner Armadillo Palace

Thursday Plenary Speaker, Dr. Kjersti Aagaard, Associate Professor, Department of Obstetrics and Gynecology, Baylor College of Medicine, "The Perinatal Microbiome."

Friday Plenary Speaker Dr. Richard Behringer, Professor, Department of Genetics, University of Texas MD Anderson Cancer Center, "Genetic Regulation of Male Sex Differentiation."

2017 TFRS Meeting Chairperson Dr. Mala Mahendroo, PhD; 2017 TFRS Meeting Organizers Drs Marie-Claude Hofmann, PhD and Chandra Yallampalli, PhD-

The group reported that two viral mimetics that activate two different innate immune system receptors, Toll-like receptors (TLRs) 3 and 7, were able to produce preeclampsia in mice and that placentas from women with preeclampsia had markedly higher expression of TLR3 and TLR7 compared to placentas from pregnant women with normal blood pressures. They found that these models of preeclampsia were exacerbated by deficiencies in the anti-inflammatory cytokines IL-4 and IL-10, of which low levels are also evident in women with preeclampsia. Supplementation with either IL-4 or IL-10 alone was able to prevent the hypertension and endothelial dysfunction in mice, however the combination of both IL-4 and IL-10 had even more beneficial effects on the kidney, placentas, and fetuses.

These mouse models of preeclampsia were also used to determine whether targeted depletion of activated innate immune cells with a peptide could affect the preeclampsia. Working with Dr. Karen Newell-Rogers from the Dept. of Surgery, together they demonstrated that an engineered peptide (VG1177) that depletes certain TLR-activated, MHC class II innate immune cells was not only able to prevent the development of preeclampsia in mice but also treat it after it had been established. VG1177 was successfully granted a patent for the treatment of preeclampsia and is moving along the pipeline as it temporarily depletes certain detrimental immune cells while leaving beneficial ones alone.

Dr. Mitchell's group also worked with Pluristem Therapeutics (Haifa, Israel) who developed PLX cells which are derived from human placentas. These mesenchymal-like stromal cells, when placed into certain environments, sense the conditions and secrete various factors that reduce inflammation and promote growth. Together, the groups reported that one injection of PLX cells was able to fully treat preeclampsia in mice in a dose-dependent manner. The cells secreted various human factors that were able to not only decrease blood pressure, restore vascular endothelial function, and reduce urinary protein excretion, but also improve placental function and fetal development. Based on these data, Pluristem recently received FDA orphan drug approval for the use of PLX cells to treat severe preeclampsia.

The current research focus is on the role that gamma-delta T cells play in the development of preeclampsia. Preliminary studies indicate that gamma-delta T cells are increased in these models of preeclampsia (Figure 1) and that depletion of gamma-delta T cells after preeclampsia is established can normalize blood pressure and other measures. Additionally, gamma-delta KO mice are resistant to the development of TLR-induced preeclampsia and placentas from women with preeclampsia have elevated levels of gamma-delta T cells.

They are also examining how renal and placental lymphatics are altered during normal pregnancy and preeclampsia. In several TLR-induced preeclampsia mouse models (TLR3, TLR4, TLR7 agonists) they see lymphatic vessel dilation in the kidney and lymphangiogenesis in the placenta.

(continued on page 11)

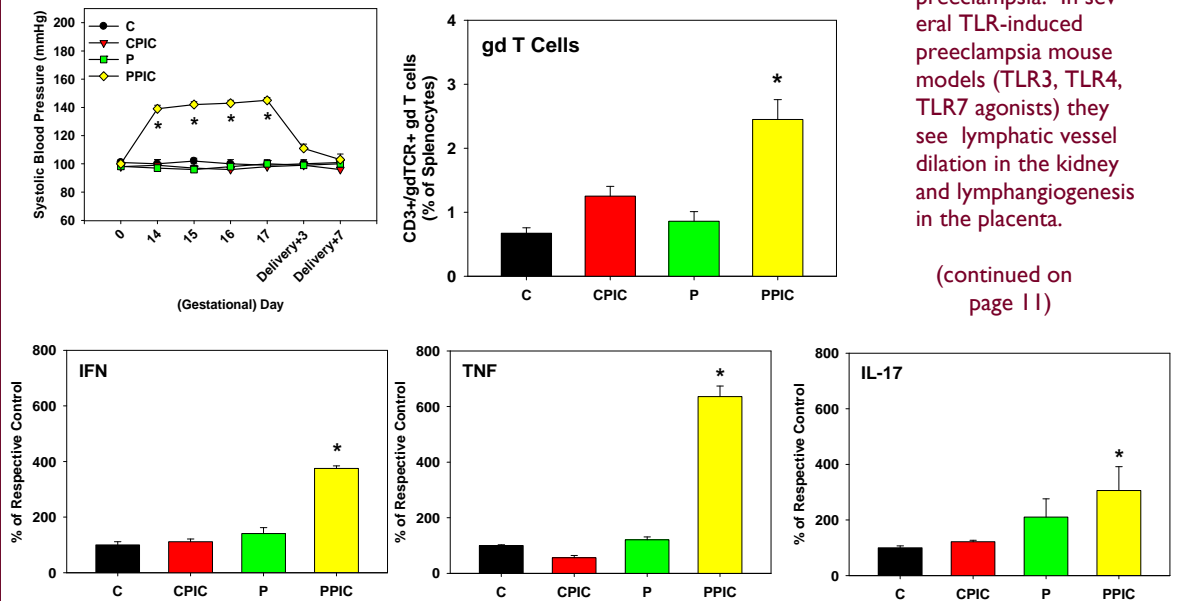


Figure 1. gd T cells and pro-inflammatory cytokines are increased in mice with TLR-induced PE. Methods: Seven pregnant mice in each group were given saline vehicle (P) or the TLR3 agonist poly I:C (PPIC) by ip injection every other day beginning on gestational day 13 and were either allowed to deliver and continue receiving injections every other day or they were euthanized on gestational day 18. Systolic blood pressures were taken by tail cuff prior to injections. Spleens were harvested and flow cytometry was performed to measure CD3+/gdTCR+ cells on gestational day 18. Gating was set based on isotype controls and FMO. Blood was obtained by cardiac puncture on gestational day 18 following anesthesia. ELISAs were performed for IFN γ , TNF α , and IL17A using commercially available kits. *p<0.05 vs. P or C.

IFRB Faculty Spotlight: Dr. Gary Williams



Dr. Gary Williams, a founding member of the Interdisciplinary Faculty of Reproductive Biology, is Regents Fellow, AgriLife Research Faculty Fellow, and Professor in the Animal Reproduction Laboratory, Texas A&M AgriLife Research Station-Beeville and Department of Animal Science, Texas A&M University-College Station. He has been recognized nationally and internationally for his research in reproductive neuroendocrinology, reproductive physiology, and reproductive management of beef cattle and horses. Along with his duties as a full-time research scientist and graduate mentor, Williams also serves as Editor-in-Chief of *Domestic Animal Endocrinology*.

Williams received B.S. and M.S. degrees in Animal Science at New Mexico State University, Las Cruces and the Ph.D. in the Interdisciplinary Training Program in Animal Physiology at the University of Arizona. After completion of the Ph.D., he began his professional career in a research and teaching position in the Department of Animal Science, North Dakota State University (NDSU), Fargo where he spent 6 years and rose to the rank of associate professor. Williams joined the Texas Agricultural Experiment Station in 1984 as a full-time research scientist with a concurrent appointment in the Department of Animal Science and membership on the Graduate Faculty at TAMU. Under his direction, the Animal Reproduction Laboratory at the 1322-acre Beeville Station was designed and completed in 1986.

Early in his career, Williams made major contributions to science and the livestock industry by increasing our understanding of the neuroendocrinology and physiology of postpartum reproduction in the suckled beef cow, and the role of dietary fat metabolism in regulating ovarian physiology during the puerperium. Recognition of this work has included receipt of the Monsanto Animal Physiology and Endocrinology award in 2004 from the American Society of Animal Science and the Regents Fellow and Faculty Fellow awards from TAMUS.

Using a variety of novel physiological approaches, Williams' research determined the mechanisms involved in suckling-mediated anovulation in cattle. This work contributed to a reversal of a 100-year-old dogma in reproduction regarding the mechanism through which the suckling stimulus impedes female reproduction and re-



vealed that the somatosensory nerves of the udder are not required for the suckling calf to inhibit gonadotropin secretion during lactation. Instead, it was learned that the maternal bond was the essential component of the calf's inhibitory influence during suckling. These series of experiments were made possible through the use of several unique surgical techniques developed by Williams in Beeville, including total surgical denervation of the mammary gland, mechanical blockade of olfaction, and a procedure for cannulation of the third cerebroventricle (IIIIV). The latter allowed, for the first time, the measurement of hypothalamic gonadotropin-releasing hormone (GnRH) and intracerebral oxytocin release in the adult bovine. This has led to improved understanding of the physiological regulation of both maternal behavior and the central control of reproduction in cattle, results

of which have been incorporated into practical protocols for managing postpartum reproduction under a variety of management scenarios.

Research relating dietary fat metabolism to ovarian physiology and use of this knowledge to enhance reproductive efficiency of cattle in marginal environments was pioneered by Williams. Fundamental studies contributed to a greatly increased understanding of dietary fat effects on ovarian cell biology and endocrinology, including novel effects mediated by changes in lipoprotein-cholesterol metabolism and metabolic endocrinology. Williams' laboratory demonstrated that the consumption of fat by cattle, particularly polyunsaturated plant oils, can positively modulate ovarian follicular growth, luteal function, and postpartum reproductive performance, independent of caloric intake. Published work has contributed to expanded use of oilseeds for beef cattle supplementation programs and development of commercial high fat supplements by most major U. S. feed manufacturers.

During the past 16 years, the Williams-Amstalden (Marcel Amstalden; colleague and former Williams trainee) team, along with other former and current trainees (e.g., Garcia, Allen, Cardoso, Alves, Zhen), have produced the majority of published work on the role of hypothalamic neuropeptides in regulating pubertal maturation in the heifer, including the fundamental roles of leptin, neuropeptide Y (NPY), proopiomelanocortin (POMC), and kisspeptin signaling pathways. Research in this area of investigation has been funded continuously since 2000 by the USDA-NRI/USDA-AFRI Competitive Research Grants program. Work has shown that increased rates of BW gain during the juvenile period promote functional alterations in the NPY-GnRH-POMC circuitry that are conducive for alleviating NPY inhibition of GnRH release. These include lower NPY concentrations in the hypothalamus as measured in the IIIIV CSF, reduced NPY gene expression, and decreased NPY innervation of GnRH neurons (**Figure 1**) in the arcuate nucleus. The foregoing occur concomitantly with increased concentrations of circulating leptin, increased expression of POMC, and a greater number of POMC-derived α -MSH fibers in contact with kisspeptin neurons (see **Figure 2** page 8).

(continued on page 8)

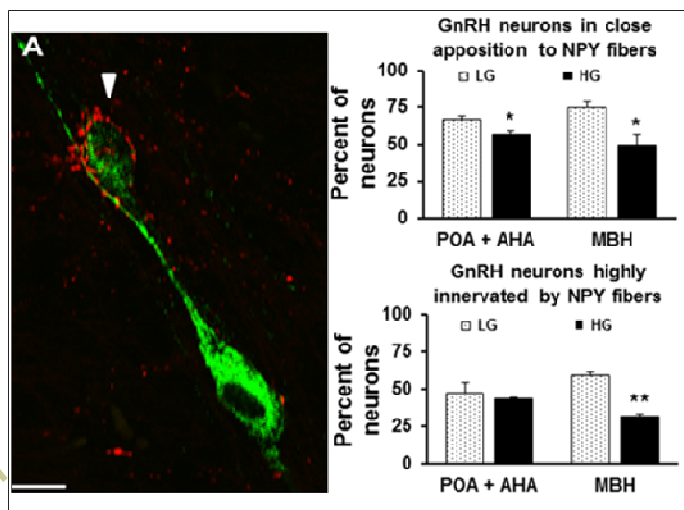


Figure 1. Early postnatal nutrition decreases NPY synaptic inputs to GnRH neurons. A high rate of BW gain during juvenile development (HG) decreases the percentage of GnRH neurons (green) in close apposition to NPY neuronal fibers (red) in prepubertal heifers (Alves et al., February 2015 Cover article for *Biology of Reproduction*)



their team has demonstrated that increased nutritional input during the perinatal development promotes functional alterations in hypothalamic neurocircuitries that are associated with an advancement in reproductive maturation. Focusing primarily on two leptin-responsive neuronal populations, the POMC/CART and the AgRP/NPY neurons, they have demonstrated that nutritional conditions that promote increased circulating concentrations of leptin result in transcriptional and morphological changes in the hypothalamus that facilitate the achievement of puberty in prepubertal bovine females (Figure 1). In collaboration with the Williams laboratory, his research team is currently investigating the potential interactions between maternal nutrition during gestation and early postnatal adiposity on pubertal development in female ruminants. The Cardoso laboratory is also interested in exploring the long-term effects of perinatal nutrition on reproductive neuroendocrine function in sexually-mature females. Based on epidemiological data and findings from different animal models, it is likely that nutritional imbalances during late gestation and/or early postnatal development will result in reproductive neuroendocrine perturbations during adulthood in female ruminants.

Another important line of research in his laboratory focuses on elucidating the mechanisms underlying reproductive neuroendocrine perturbations in females prenatally exposed to androgen excess. In conjunction with a team of outstanding researchers

from the University of Michigan, Dr. Cardoso was able to demonstrate that postnatal endocrine imbalances, namely functional hyperandrogenism and hyperinsulinemia, play a critical role in promoting LH hypersecretion in prenatal testosterone-treated sheep, an animal model of polycystic ovary syndrome (PCOS). They have demonstrated that pituitary LH hypersecretion is likely a function of compensatory hyperinsulinemia in prenatal testosterone-treated sheep (Figure 2). Moreover, they observed that postnatal treatment with an insulin sensitizer (rosiglitazone) normalizes the GnRH-stimulated LH secretion in this sheep model, a finding that is likely to have important translational relevance to reproductive health in women with PCOS. His research group is currently using this knowledge to elucidate the epigenetic and transcriptional changes that occur during fetal development that may contribute to the development of LH hypersecretion in female sheep prenatally exposed to androgen excess.

Through the integration of whole animal physiology with cellular and molecular biology, Dr. Cardoso's long-term research goals are to contribute to better understand the mechanisms by which the perinatal environment can modulate several reproductive processes in the offspring. He is honored and excited to be back to Texas A&M University, and is looking forward to interacting and collaborating with other IFRB investigators. ***

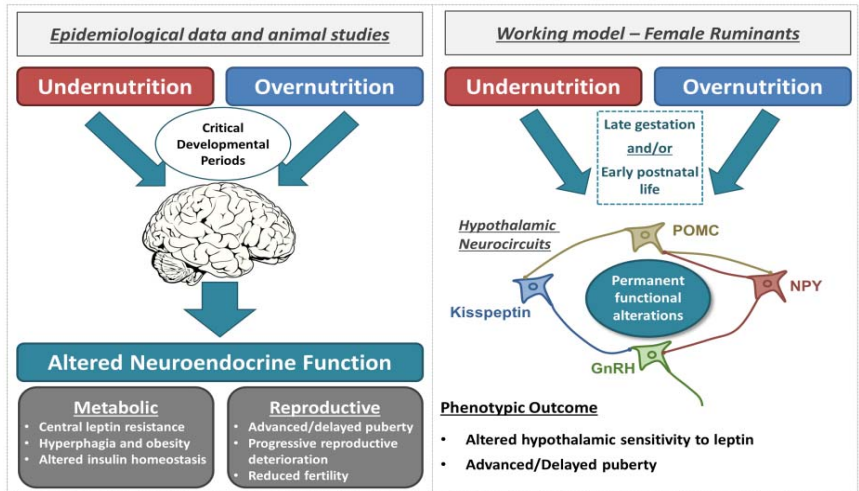


Figure 1. Developmental programming of the neuroendocrine system. Left panel: Epidemiological data and animal studies indicate that nutritional imbalances during critical periods of development are associated with lifelong alterations in metabolic and reproductive function. Right panel: Nutritional input during late gestation and/or early postnatal development lead to permanent, functional alterations in leptin-sensing hypothalamic neurocircuitries that control pubertal maturation in female ruminants.

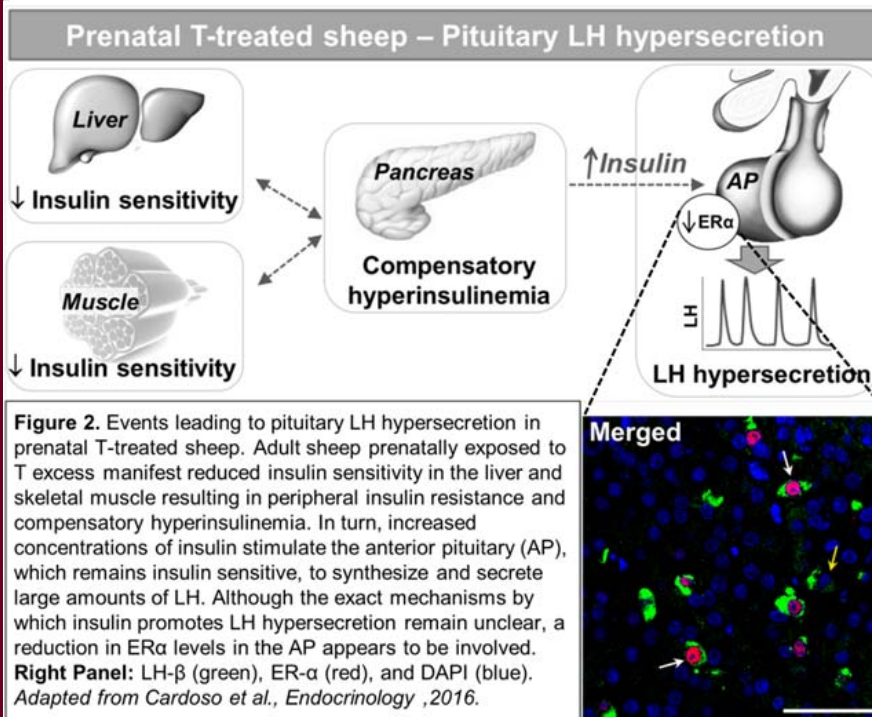


Figure 2. Events leading to pituitary LH hypersecretion in prenatal T-treated sheep. Adult sheep prenatally exposed to T excess manifest reduced insulin sensitivity in the liver and skeletal muscle resulting in peripheral insulin resistance and compensatory hyperinsulinemia. In turn, increased concentrations of insulin stimulate the anterior pituitary (AP), which remains insulin sensitive, to synthesize and secrete large amounts of LH. Although the exact mechanisms by which insulin promotes LH hypersecretion remain unclear, a reduction in ERα levels in the AP appears to be involved. **Right Panel:** LH-β (green), ER-α (red), and DAPI (blue). Adapted from Cardoso et al., *Endocrinology*, 2016.

IFRB Seminar Series, Fall 2016



The IFRB Seminar Series, **Reproductive Biology Forum**, has been held weekly during the Fall and Spring Semesters since 1990. The Spring 2016 IFRB Seminar Series was coordinated by **Dr. Michael Golding** and the Fall Series by **Dr. Sakhila Banu**.

Fall Semester Speakers Included:



September 2, **Dr. Dolores J. Lamb**, Scott Dept. of Urology, Baylor College of Medicine, "Genetic and genomic causes of male reproductive failure"

September 9, **Mr. Kirthiram K. Sivakumar**, Veterinary Inte-

grative Biosciences, "Molecular mechanism of hexavalent chromium-induced premature ovarian failure."

Dr. Jone Stanley Arulrajadurai, "Resveratrol protects the ovary against chromium-induced toxicity."

September 16, **Ms. Brianna Myre**, Department of Biology, "Fasting physiology and resource allocation during reproduction in Costa Rican Olive Ridley sea turtles."

September 23, **Dr. Fuller Bazer**, Physiology of Reproduction, Department of Animal Science, "Potential roles of fructose: The major hexose sugar in conceptuses of ungulates and cetaceans."

September 30, **Dr. William H. Griffith**, Neuroscience and Experimental Therapeutics, TAMUHSC, "Estrogen signaling in basal forebrain neu-



rons from both male and female F344 rats across aging and reproductive senescence."



October 7, **Dr. Andrea Trache**, Medical Physiology and Biomedical Engineering,, "Mechanotransduction in vascular smooth muscle cells studied by atomic force microscopy."

October 14, **Dr. Jay Ramadoss**, VTPP,

"Maternal perspectives in fetal alcohol spectrum disorders: Mechanisms and diagnosis." October 21, **Tenth Annual IFRB Retreat and Twenty-Second Annual Dr. Raymond O. Berry Memorial Lecture.**



October 28, **Dr. Pushkar Lele**, Department of Chemical Engineering,

"Dynamics of self-assembly and adaptation of biological molecular motors. November 4, **Dr. Rodolfo Cardoso**, Animal

Science, "Developmental programming of the reproductive neuroendocrine system." November 11, **Dr. Qinglei Li**, Veterinary Integrative Biosciences, "New Insights into TGF β signaling and genetic aberrations in ovarian granulosa cell tumor development."

November 18, **Dr. Sathish Kumar**, Department of ObGYN, University of Texas Medical Branch,



"Androgens, pregnancy and long term fetal health."

December 2, **Dr. Michael J. Soares**, Ph.D,

Director, Institute for Reproductive Health & Regenerative Medicine & Department of Pathology & Laboratory Medicine. "Plasticity and Placental Health"

December 9, **Dr. Yasser Lenis Sanin**, Animal Science,

"Effects of agmatine on secretion of interferon tau and catecholamines and expression of genes related to production of polyamines by ovine trophoblast cells."

December 16, **Yang Gao**, Veterinary Integrative Biosciences, "Abrogation of Transforming Growth Factor- β receptor 1 in PTEN-inactivated endometrium reveals a metastatic switch that promotes endometrial cancer progression." **Dr. Shameena Bake**, Assistant Professor, Neuroscience and Experimental Therapeutics, TAMUHSC "IGF-I therapy and stroke outcome in middle-aged female rats: Role of blood brain barrier."

International Scholars

***Dr. Renato Salgado** did his PhD and postdoctoral studies in Reproductive Biology at the University of Sao Paulo, Brazil, studying the remodeling of the uterine extracellular matrix orchestrated by estradiol and progesterone in a mouse model. Following completion of his studies, Renato worked as a human embryologist for four years. He joined **Dr. Katrin Hinrichs'** Equine Embryo Laboratory at Texas A&M University in February 2017, and is currently working in equine embryology, performing studies on intracytoplasmic sperm injection and embryo vitrification.

***Dr. Mohammed Ahmed Elmetwally** is an Assistant Prof. of Theriogenology, Fac.Vet.Med, Mansoura University, Egypt who recently joined the laboratory of **Dr. Fuller Bazer**. He is interested in uterine



biology and intrauterine fetal development and is evaluating the use of color Doppler as a noninvasive tool to study the effect of maternal anxiety on uterine and umbilical blood flow changes during pregnancy in sheep and goats. He is also studying the effect of catecholamine on ovine trophoblast cells. Previously, he completed a doctoral thesis in Germany at the Institute for Reproductive Biology, University for Veterinary Medicine with Prof. Sabine Meinecke-Tillmann. His thesis was related to clinical applicability of color Doppler sonography during pregnancy in sheep and goats. He also worked in the cattle clinic in Hannover for one and half year on the effects of biological and nonbiological substance on uterine and vaginal blood flow, with Prof. Dr. Heiner Bollwein.



IFRB Trainee News

NEW GRADUATE STUDENT TRAINEES



***Jonathan C. Behlen** graduated from Texas A&M University in 2011 with a BS in Molecular and Cell Biology. Following graduation, he went into industry for four years working in the biochemical and oil and gas fields. After realizing he wanted to pursue an even higher education, he matriculated into a master's program and subsequently transferred into a PhD program in **Dr. Sakhila Banu's** laboratory in August 2016. He is currently interested and

studying how hexavalent chromium affects placentation, in particular, trophoblast cell differentiation, migration and spiral artery remodeling.

***Xin Fang** received her B.S. degree in Nanjing Agricultural University, China. She began her graduate research assistantship in **Dr. Qinglei Li's** lab at Texas A&M University in May 2016. Her research focuses on understanding the role of TGF-beta signaling in reproductive development and cancer.



***Kitty Halloran** is from California. She earned a B.S. in Animal Science from California Polytechnic State University and began graduate studies at TAMU this summer under the guidance of **Dr. Bazer** and **Dr. Wu**. She is currently working on a joint project to elucidate the effects of exogenous progesterone on ovine conceptus growth



and development.

***Emily Hoskins (Townsend)** is from Friendswood, TX and received a B.S. in Animal Science and M.A. in music at TAMU. She is pursuing her M.S. in Physiology of Reproduction under the mentorship of **Drs. Fuller Bazer** and **Guoyao Wu**. She is working on a joint project that focuses on the effects of exogenous progesterone on the growth and viability of sheep conceptuses.

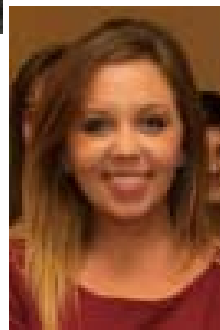


***Camille Goblet** completed her undergraduate degree at Oregon State University where she received her B.S. In Zoology. Camille joined **Dr. Annie Newell-Fugate's** lab at Texas A&M where her current project focuses on wildlife reproductive endocrinology and the effects of the introduction of novel pheromones in breeding pairs of Red River Hogs in North American zoos.

***Cassandra Skenandore** (Cassie) is a first-generation college-student from Springfield, IL with a background in Dairy Science. She received her B.S. and M.S. in Animal Sciences from the University of Illinois at Urbana-Champaign. Cassie brought her husband and two dogs to Texas A&M University in August 2015 to start her Ph.D. under **Dr.**



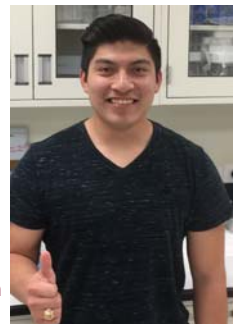
Newell-Fugate. Cassie's research uses porcine models to assess the effects of fat source in lean and high fat diets on growth, metabolism, steroidogenesis, and adipose tissue function in lean and obese females.



***Ashley Padgett** completed her undergraduate education at Texas A&M, where she received her Bachelors degree in Biomedical Sciences in May 2016. She began working in **Dr. Shannon Washburn's** lab as an undergraduate student and gained experience using the pregnant sheep model, including collaborative work with Dr. John Brosnan examining the role of folate during pregnancy. She chose to pursue her interest in research and started her Masters in Dr.

Washburn's lab this past fall. Her thesis work will focus on the maternal-fetal implications and effects of anesthesia and analgesia during pregnancy, as well as determining concentrations of oxytetracycline in the fetal compartment after maternal administration.

***Josue Ramirez** graduated with a B.S. in Biomedical Science in 2016. He is a veteran of the United States military who served in Afghanistan as an infantryman in 2011. He starts graduate school in January 2017 and will join the laboratory of **Dr. Jay Ramadoss** as a graduate research assistant. His work will be centered on the Collaborative Initiative in Maternal and Infant Health Research (CIMPIR) Tier One Grant that will provide students the opportunity to acquire laboratory research experience.



(continued on page 10)

Frontiers in Reproduction Molecular and Cellular Concepts and Applications Woods Hole, Massachusetts 29 April - 11 June, 2017 Application Deadline: 11 January 2017 Full description and additional information may be found here: <http://fir.mbl.edu> FIR Poster: <https://fir.egnyte.com/dll/dpC3jEgRm6> Outcomes of an Intensive Summer Course in Reproductive Biology: <http://www.biolreprod.org/content/74/2/230.abstract> Frontiers in Reproduction (FIR). An Assessment of Success: <http://www.biolreprod.org/content/ear-ly/2016/06/116/biolreprod.116.140384>



A Snapshot of IFRB Research, 2016

The IFRB is recognized as one of the most productive interdisciplinary research and education programs in reproductive biology in the U.S. The following “snapshot” of research productivity illustrates the multiple investigator research activities of the IFRB, involving extensive participation of trainees during 2016:

- Alves BRC, Cardoso RC, Doan R, Zhang Y, Dindot SV, Williams GL, Amstalden M. Nutritional programming of accelerated puberty in heifers: alterations in DNA methylation in the arcuate nucleus. *Biol. Reprod.* 2016;10.1095/biolreprod.116.144741
- Arosh JA, Banu SK, McCracken JA. Novel concepts on the role of prostaglandins on luteal maintenance and maternal recognition and establishment of pregnancy in ruminants. *J Dairy Sci.* 2016 Jul;99(7):5926-40.
- Bake S, Gardner R, Tingling JD, Miranda RC, Sohrabji F. Fetal alcohol exposure alters blood flow and neurological responses to transient cerebral ischemia in adult mice. *Alcohol Clin Exp Res.* 2016 Dec 17. doi:10.1111/acer.13277
- Balaraman S, Schafer JJ, Tseng AM, Wertelecki W, Yevtushok L, Zymak-Zakutnya N, Chambers CD, Miranda RC. Plasma miRNA profiles in pregnant women predict infant outcomes following prenatal alcohol exposure. *PLoS One.* 2016 Nov 9;11(11):e0165081.
- Banu SK, Stanley JA, Sivakumar KK, Arosh JA, Taylor RJ, Burghardt RC. Chromium VI - Induced developmental toxicity of placenta is mediated through spatiotemporal dysregulation of cell survival and apoptotic proteins. *Reprod Toxicol.* 2016 Jul 18. pii: S0890-6238(16)30263-5. doi: 10.1016/j.reprotox.2016.07.006. Banu SK, Stanley JA, Sivakumar KK, Arosh JA, Burghardt RC. Resveratrol protects the ovary against chromium-toxicity by enhancing endogenous antioxidant enzymes and inhibiting metabolic clearance of estradiol. *Toxicol Appl Pharmacol.* 2016 Jul 15;303:65-78.
- Boakye CH, Patel K, Patel AR, Faria HA, Zucolotto V, Safe S, Singh M. Lipid-based oral delivery systems for skin deposition of a potential chemopreventive DIM derivative: characterization and evaluation. *Drug Deliv Transl Res.* 2016 Oct;6(5):526-39.
- Boakye CH, Patel K, Doddapaneni R, Bagde A, Behl G, Chowdhury N, Safe S, Singh M. Ultraflexible nanocarriers for enhanced topical delivery of a highly lipophilic antioxidative molecule for skin cancer chemoprevention. *Colloids Surf B Biointerfaces.* 2016 Jul 1;143:156-67.
- Boulton K, Rosenthal GG, Grimmer AJ, Walling CA, Wilson AJ. Sex-specific plasticity and genotype × sex interactions for age and size of maturity in the sheephead swordtail, *Xiphophorus birchmanni*. *J Evol Biol.* 2016 Mar;29(3):645-56.
- Bridi MS, Hawk JD, Chatterjee S, Safe S, Abel T. Pharmacological activators of the NR4A nuclear receptors enhance LTP in a CREB/CBP-dependent manner. *Neuropsychopharmacology.* 2016 Dec 7. doi: 10.1038/npp.2016.253. [Epub ahead of print]
- Birch SM, Lenox MW, Kornegay JN, Paniagua B, Styner MA, Goodlett CR, Cudd TA, Washburn SE. Maternal choline supplementation in a sheep model of first trimester binge alcohol fails to protect against brain volume reductions in peripubertal lambs. *Alcohol.* 2016 Sep;55:1-8.
- Brito LF, Althouse GC, Aurich C, Chenoweth PJ, Eilts BE, Love CC, Luvoni GC, Mitchell JR, Peter AT, Pugh DG, Waberski D. Andrology laboratory review: Evaluation of sperm concentration. *Theriogenology.* 2016 Jun;85(9):1507-27.
- Cardoso RC, Burns A, Moeller J, Skinner DC, Padmanabhan V. Developmental Programming: Insulin sensitizer prevents the GnRH-Stimulated LH hypersecretion in a sheep model of PCOS. *Endocrinology.* 2016 Dec;157(12):4641-4653.
- Cardoso RC, Veiga-Lopez A, Moeller J, Beckett E, Pease A, Keller E, Madrigal V, Chazenbalk G, Dumesic D, Padmanabhan V. Developmental programming: Impact of gestational steroid and metabolic milieu on adiposity and insulin sensitivity in prenatal testosterone-treated female sheep. *Endocrinology.* 2016 Feb;157(2):522-35.
- Chatterjee P, Chiasson VL, Pinzur L, Raveh S, Abraham E, Jones KA, Bounds KR, Ofir R, Flaishon L, Chajut A, Mitchell BM. Human placenta-derived stromal cells decrease inflammation, placental injury and blood pressure in hypertensive pregnant mice. *Clin Sci (Lond).* 2016 Apr 1;130(7):513-23.
- Cheng Y, Jin UH, Davidson LA, Chapkin RS, Jayaraman A, Tamamis P, Orr A, Allred C, Denison MS, Soshilov A, Weaver E, Safe S. Microbial-derived 1,4-Dihydroxy-2-naphthoic acid and related compounds as aryl hydrocarbon receptor agonists/antagonists: Structure-activity relationships and receptor modeling. *Toxicol Sci.* 2016 Nov 11. pii: kfw230. [Epub ahead of print]
- Choi YH, Hinrichs K. Vitriification of in vitro-produced and in vivo-recovered equine blastocysts in a clinical program. *Theriogenology.* 2017 Jan 1;87:48-54.
- Choi YH, Gibbons JR, Canesin HS, Hinrichs K. Effect of medium variations (zinc supplementation during oocyte maturation, perifertilization pH, and embryo culture protein source) on equine embryo development after intracytoplasmic sperm injection. *Theriogenology.* 2016 Oct 15;86(7):1782-8.
- Choi YH, Velez IC, Macías-García B, Riera FL, Ballard CS, Hinrichs K. Effect of clinically-related factors on in vitro blastocyst development after equine ICSI. *Theriogenology.* 2016 Apr 15;85(7):1289-96.
- Chowdhury P, Akel N, Jamshidi-Parsian A, Gaddy D, Griffin RJ, Yadlapalli JS, Dobretsov M. Degenerative Tissue Responses to Space-like Radiation Doses in a Rodent Model of Simulated Microgravity. *Ann Clin Lab Sci.* 2016 Spring;46(2):190-7.
- Churion KA, Rogers RE, Bayless KJ, Bondos SE. Separating full-length protein from aggregating proteolytic products using filter flow-through purification. *Anal Biochem.* 2016 Dec 1;514:8-11.
- Clanton RM, Wu G, Akabani G, Aramayo R. Control of seizures by ketogenic diet-induced modulation of metabolic pathways. *Amino Acids.* 2016 Sep 28. [Epub ahead of print]
- Cui R, Schumer M, Rosenthal GG. Admix'em: a flexible framework for forward-time simulations of hybrid populations with selection and mate choice. *Bioinformatics.* 2016 Apr 1;32(7):1103-5.
- Darr CR, Varner DD, Teague S, Cortopassi GA, Datta S, Meyers SA. Lactate and pyruvate are major sources of energy for stallion sperm with dose effects on mitochondrial function, motility, and ROS production. *Biol Reprod.* 2016 Aug;95(2):34.
- Darr CR, Cortopassi GA, Datta S, Varner DD, Meyers SA. Mitochondrial oxygen consumption is a unique indicator of stallion spermatozoal health and varies with cryopreservation media. *Theriogenology.* 2016 Sep 15;86(5):1382-92.
- Dave JM, Abbey CA, Duran CL, Seo H, Johnson GA, Bayless KJ. Hic-5 mediates the initiation of endothelial sprouting by regulating a key surface metalloproteinase. *J Cell Sci.* 2016 ;129(4):743-56.
- Delgado E, Boisen MM, Laskey R, Chen R, Song C, Sallit J, Yochum ZA, Andersen CL, Sikora MJ, Wagner J, Safe S, Elishaev E, Lee A, Edwards RP, Haluska P, Tseng G, Schurdak M, Oesterreich S. High expression of orphan nuclear receptor NR4A1 in a subset of ovarian tumors with worse outcome. *Gynecol Oncol.* 2016 May;141(2):348-56.
- Duan Y, Li F, Li Y, Tang Y, Kong X, Feng Z, Anthony TG, Watford M, Hou Y, Wu G, Yin Y. The role of leucine and its metabolites in protein and energy metabolism. *Amino Acids.* 2016 Jan;48(1):41-51.
- Duan J, Yin J, Ren W, Liu T, Cui Z, Huang X, Wu L, Kim SW, Liu G, Wu X, Wu G, Li T, Yin Y. Dietary supplementation with L-glutamate and L-aspartate allevi

(continued on page 13)



Faculty Spotlight, Dr. Williams (cont'd from page 3)

Journal cover highlighting a 2015 paper by Bruna R.C. Alves, Rodolfo C. Cardoso, Ligia D. Prezotto, Jennifer F. Thorson, Michelle Bedenbaugh, Sarah M. Sharpton, Alain Caraty, Duane H. Keisler, Luis O. Tedeschi, Gary L. Williams, and Marcel Amstalden.

Neuropeptide Y (NPY) neuronal fibers (red) in close-apposition to GnRH neurons (green) are diminished in response to an elevated rate of body weight gain during the juvenile period in the female bovine. This finding supports the premise that the inhibitory effect of NPY on GnRH release is reduced in individuals subjected to dietary regimens that promote earlier onset of puberty.

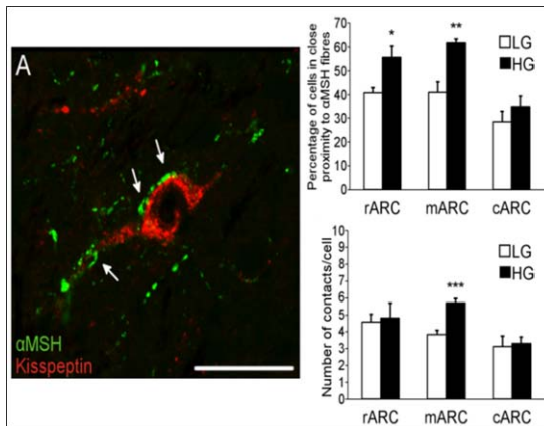
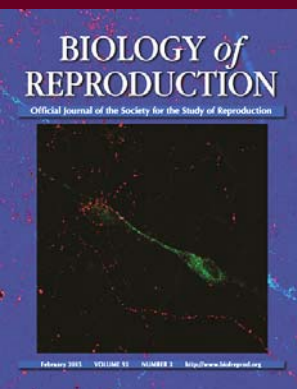


Figure 2 Early postnatal nutrition increases α MSH synaptic inputs to kisspeptin neurons. High rate of BW gain during juvenile growth (HG) increases the percentage of kisspeptin neurons (red) in close contact to α MSH neuronal fibers (green) in prepubertal heifers (Cardoso et al. 2015; *J. Neuroendocrinol.* 27: 647-657).

Such changes appear to mediate the nutritional programming of the reproductive neuroendocrine axis and facilitate an early onset of puberty in heifers. Importantly, applied studies have demonstrated that the age at onset of puberty can be nutritionally programmed by exposing heifers to a stair-step nutritional regimen (Figure 3) during juvenile development and can be used to time reproductive maturation consistently so that the majority of replacement beef heifers have reached puberty at 11 to 14 mo of age, while avoiding a high incidence of precocious puberty. Most recently, these interrelationships have been examined in relation to epigenetic changes created by perinatal nutrition. In this context, the neuroendocrine axis is responsible for integrating the operational control of a variety of nutritional and reproductive processes. In recent years, mounting evidence has shown that nutritional imbalances during perinatal development can permanently alter the organization of this system, resulting in lifelong alterations of reproductive function in female offspring. To this end, Williams' interdisciplinary research team has specifically focused on temporal changes in neuroendocrine networks that respond to nutritional programming during the perinatal period. They have now demonstrated that changes in hypothalamic gene expression and neuronal morphology are accompanied by alterations in DNA methylation of key genes associated with the pubertal process (*Biol. Reprod.* In press; 10.1095/biolreprod.116.144741).

A currently-funded USDA-AFRI project is evaluating these processes further by examining the interaction of pre- and postnatal nutrition on hypothalamic networks controlling pubertal development and mature reproductive phenotype.

Neuroendocrine control of reproductive seasonality in the mare. Investigations involving the neuroen-

doctrone control of reproductive seasonality in the mare have also been a significant recent focus of the Williams lab. These investigations, funded by the Link Equine Research Fund, Texas A&M AgriLife Research and regional horse breeders, have exploited the unique functional character of the equine gonadotropin to develop strategies for using native GnRH as a continuous modulator of pituitary-ovarian function, and sought to understand the role of a novel hypothalamic neuropeptide, RF-amide-related peptide 3 (gonadotropin inhibitory hormone; GnIH) in equine seasonality. Translational studies have demonstrated the ability of continuous, subcutaneous infusion of native GnRH treatment to accelerate the timing of pregnancy in mares by up to 2 months within a normal management setting. In addition, during the last 15 yrs., an entirely new neuroendocrine signaling pathway involving the RF-amide related peptides (RFRP), particularly RFRP3 or gonadotropin-inhibitory hormone

(continued on page 14)

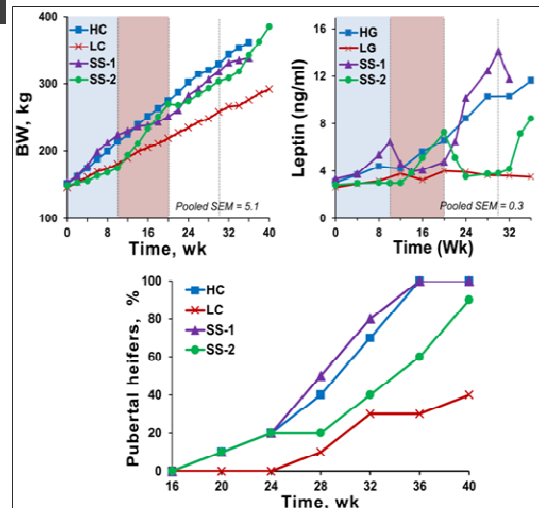


Figure 3. Increased BW gain within a specific developmental window programs the neuroendocrine axis for advanced puberty. Changes in BW (top, left), circulating concentrations of leptin (top, right) and onset of puberty (bottom) in heifers fed to gain BW at a low rate (LG), high rate (HG), or undergo alternating periods of ad libitum (blue shaded area) and restricted (red shaded area) feeding (SS-1). Although SS-1 heifers were subjected to a period of marked feed restriction between 6.5 to 9 months of age (red shaded area), puberty was advanced to a similar degree as that observed in HG heifers, suggesting that neuroendocrine changes programmed during the initial ad libitum period (blue shaded area) persist until reproductive maturation (Cardoso et al., 2015; *J. Anim. Sci.* 92: 2942-2949).

22nd Annual Dr. Raymond O. Berry Memorial Lecture

The Twenty-Second Annual Dr. Raymond O. Berry Memorial Lecture, sponsored and organized by the Interdisciplinary Faculty of Reproductive Biology, was held at the Navasota Civic Center, Navasota, TX on October 21, 2016. Gil Mor, M.D., Ph.D., Professor of Obstetrics and Gynecology and Reproductive Science at Yale University School of Medicine, was selected by a vote of IFRB faculty to present the Lecture entitled, "Polymicrobial Infections During Pregnancy: Maternal and Fetal Risks."



Dr. Duane C. Kraemer, who worked with Dr. Berry during his early years as a graduate student, led off the Lecture by providing an entertaining presentation that included memories of Dr. Berry.

Dr. Mor received his training in Israel with the M.D. and M.S. degrees from the Hebrew University Medical School and Hebrew University, respectively, and the Ph.D. in Immunoendocrinology from the Weizmann Institute of Science. He was also a postdoctoral fellow in the Max-Planck Institut fur Experimental Endocrinologie in Hanover, Germany and in the Laboratory of Immunobiology at the National Institutes of Health. Dr. Mor is Division Director of the Reproductive Science Division in the Department of Obstetrics and Gynecology and he directs the Reproductive Immunology Unit and the Translational Research Program "Discovery To Cure" at Yale University.

A major objective of Dr. Mor's research is to understand communication between the maternal and fetal components of pregnancy and how pathogens contribute to disruption of this crosstalk leading to preterm labor. He also examines topics related to the immunology of pregnancy and the role of inflammation in cancer formation and progression. Dr. Mor has been the Editor in Chief of the *American Journal of Reproductive Immunology* since September, 2009.

Dr. Mor's research is funded by grants from National Institute of Child Health Development, National Cancer Institute, National Institute of Allergies and Infectious Diseases and pharmaceutical companies. He is widely published in the areas of immunology, cancer biology and reproductive biology with more than 250 publi-

cations and he has edited three books on "Immunology of pregnancy" and "Apoptosis and Cancer."

He is recipient of several national and international prizes, including the J. Christian Herr Award from the Society for Reproductive Immunology and the Harold Behrman Award from Yale University. He is also Honorary member of several scientific societies in Asia, South America and Europe, and he is an active member of the American Association for Cancer Research, the Society for Gynecologic Investigation, American Association of Immunologist and the American Society of Reproductive Immunology.

Dr. Mor teaches graduate courses in both immunology and developmental biology, as well as an undergraduate level course in reproductive immunology. He has a strong program in graduate education through which he has mentored 46 undergraduate students, 8 graduate students, 33 postdoctoral fellows and 17 medical students and fellows. He shares his knowledge nationally and internationally through his publications and presentations at scientific meetings, as well as many invited seminars and lectures.

Right: Dr. Greg Johnson presents Dr. Mor with a plaque commemorating his presentation as the Twenty-second Annual Dr. Raymond O. Berry Memorial Lecturer.

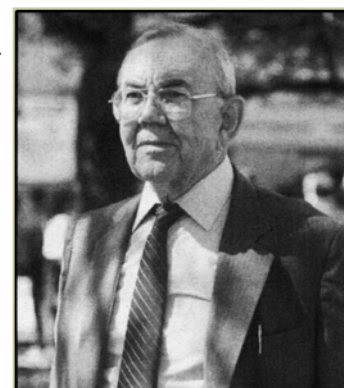


For his outstanding contributions, Texas A&M University recognizes the work of Dr.

Mor through the Raymond O. Berry Memorial Lecture which was established in 1994 by **Dr. Fuller W. Bazer**. This Lecture Series ensures that his contributions will continue to inspire students and faculty whose application of biotechnology to the field of reproductive biology contributes to animal agriculture and impacts the biomedical community. Dr. Berry's pioneering studies of genetic factors affecting reproduction contributed basic knowledge about maternal immune recognition of the fetal-placental unit. These principles are now fundamental to the discipline of reproductive immunology. Over the past 22 years, Dr. Berry's daughters, Dorothy McLemore and Margaret Thompson and family members have attended the Lecture as guests. This year, Dr. Joe McLemore, son-in-law of Dr.

Berry and husband of his daughter, Dorothy, joined the IFRB for the Lecture. For the first time in 22 years, Dr. Bazer was unable to host the Lecture as he was in Israel carrying out a study with colleagues there.

Left: Dr. Duane Kraemer, Dr. Joe McLemore, Dorothy McLemore, Dr. Gil Mor, Dr. Gary Newton, Dr. Greg Johnson and Dr. Chuck Long

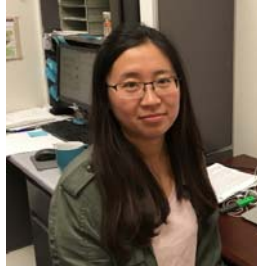


"Dr. Berry's pioneering studies contributed basic knowledge about maternal immune recognition of the fetal-placental unit."

-Fuller W. Bazer



***Nan Ni** received her Bachelor of Medicine degree in Jilin University, China. She began her graduate research assistantship in **Dr. Qinglei Li's** lab at Texas A&M University in September 2016. Her research focuses on understanding the role of TGF-beta signaling in endometrial biology and pathology.



***Avery Kramer** recently joined the laboratory of **Dr. Greg Johnson** following the completion of her M.S. degree in Animal Science from the University of Wyoming. Her project is focused on the molecular signaling of interferon gamma and its role within the uterine environment of pigs during early pregnancy.

***Bryan McLendon** also joined Dr. Greg Johnson's Laboratory after completing his B.S. in Animal Science from Texas A&M University. He will be studying reproductive biology with a focus on the effects of interferon gamma during early pregnancy in the pig.



***Amanda N Bradbery** is a PhD student in the Department of Animal Science. She received her B.S. in Animal Science from Virginia Tech. After completing her B.S., she remained at Virginia Tech as the Campbell Arena Supervisor/Riding Instructor and served as assistant coach for the Hunt Seat IHSA Team. In January of 2013, she began her graduate career, completing her M.S. in Animal Science in December 2014 with a focus in equine nutrition and joint inflammation under Dr. Josie Coverdale. She continued directly into a doctoral program under Dr. Josie Coverdale, and now works under Drs. Carey Satterfield, Tryon Wickersham, and Kathrin Dunlap investigating the effects of maternal overnutrition on foal development.

***Lacey Quail, Christian Cook and Marianna Mund** are three new students working with **Drs. Ron Randel and Tom Welsh**.

Lacey earned a B.S. in Animal Science from South Dakota State University. Her undergraduate research project focused on implementation of an artificial insemination program and assessment of its impact on herd calving date and calf weaning weight. Her thesis project focuses on the relationships between antral follicle counts, postpartum interval, and conception and pregnancy rates in Brahman females. ***Christian Cook** earned a B.S. in Animal Science from Oklahoma State University in May 2015. entered the Physiology of Reproduction graduate program in Summer 2016 at TAMU. Her M.S. project focuses on development of an immune response selection tool



to improve the health of Brahman cows and calves. ***Marianna Mund** earned a B.S. in Animal Science from TAMU in 2015. After working with the V8 Ranch's purebred Brahman herd, she joined the Physiology of Reproduction M.S. program. She will conduct thesis research for the next 8 months at the AgriLife Research



Center in Overton. She will return to College Station to finish course and lab work. Mari's project is focused on the cow-calf immune system inter-relationships and postnatal growth performance of Brahman calves.

***Dr. Bruna Alves**, who completed her Ph.D. in Physiology of Reproduction under the mentorship of Drs. Marcel Amstalden and Gary Williams in 2014, will begin a position as Assistant Professor in the Department of Agriculture, Nutrition and Veterinary Science at the University of Nevada-Reno in July 2017.



GRADUATE STUDENT AWARDS



***Brin Myre**, trainee in **Dr. Duncan MacKenzie's** laboratory received a LT Jordan Fellowship from the MSC Jordan Institute at

TAMU to assist her in her field research in Costa Rica. Brin also completed a year of breeding season field sampling of Olive Ridley sea turtles in Costa Rica.

NEW POSTDOCTORAL SCIENTISTS



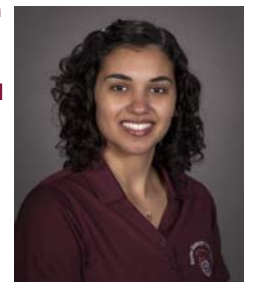
***Dr. Matthew Nemec** attended Miami University in Oxford, OH where he received his B.A. in Zoology and Philosophy in 2008. He then received his M.S. in Toxicology at San Diego State University and industrial training at Johnson & Johnson. In 2012 Matt joined the Toxicology program at TAMU. He completed his PhD in Summer of 2016, and joined **Dr. Jay Ramadoss'** lab to continue his training as a Postdoctoral Research Associate.

His research focuses on establishing a translational model to study effects of electronic cigarette vapor on fetal development.

* **Dr. Aileen Rowland** joined the Comparative Orthopedics and Regenerative Medicine Laboratory in June 2016. She completed her DVM at Colorado State in 2014, and then spent a year at Equine Sports Medicine and Surgery in Weatherford, TX followed by a year at Cornell Ruffian Equine Specialists in Elmont, NY. Her main focus is the performance horse and working to find improved regenerative therapies that can be applied clinically.



***Dr. Hélène Resende** graduated with a DVM in 2011 from the Federal Rural University of Rio de Janeiro, Brazil. In 2014, she received her Masters in Animal Reproduction at Sao Paulo State University (UNESP Botucatu), Brazil, with research focused on ovarian and uterine blood flow in young and old mares. She worked as an equine practitioner in



(continued on page 16)



New Faculty, Brett Mitchell (cont'd from page 4)

Placentas from women with preeclampsia also exhibit lymphangiogenesis (**Figure 2**).

In addition to working with groups from industry, the Mitchell lab is working with Dr. Newell-Rogers and Dr. Robert Alaniz (Dept. of Microbial Pathogenesis and Immunology) on the gamma-delta T cell

studies and Drs. David Zawieja, Joe Rutkowski, Mari Muthuchamy, and others from the Department of Medical Physiology on the lymphatic studies. They are also working in conjunction with Drs. Brandie Taylor and Mahua Choudhury on translational preeclampsia studies and are open to further areas of preeclampsia-related research. ***

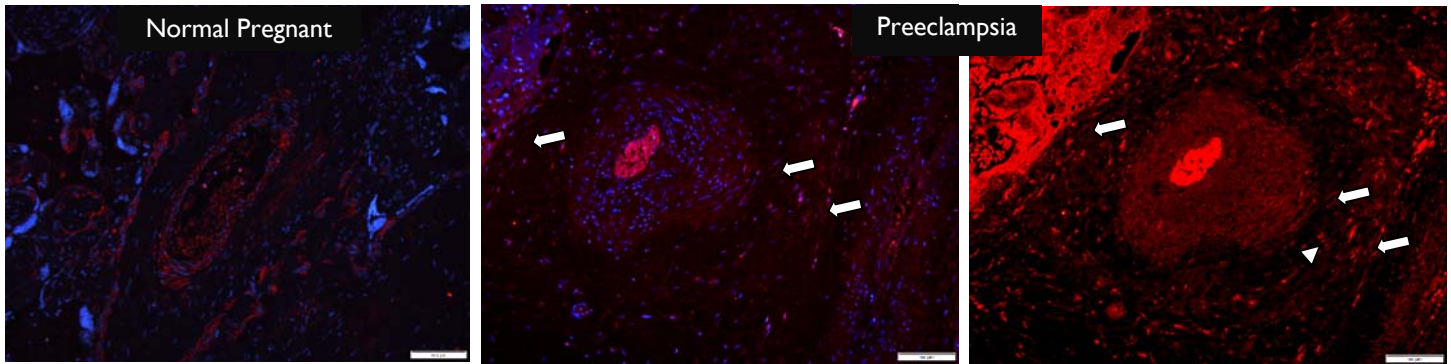


Figure 2. Placental lymphangiogenesis in women with PE. Methods: Paraffin-embedded placental slices were obtained from normotensive women and women with PE as described in our previous paper (Chatterjee et al., PLoS One, 2012). The slices were de-paraffinized and stained with anti-podoplanin followed by a 594 nm-conjugated secondary antibody and DAPI for blue nuclei staining. Images were taken at 20x magnification (scale bar = 100 μ m). Similar results were found for LYVE-1 staining of serial sections. The white arrows point to lumen-containing, podoplanin positive, stained vessels ~30-40 μ m in size. The arrowhead points to 2 lumen-containing vessels but are ~8-10 μ m. The 2 images of the PE placenta are the same, with DAPI in the left image and the right image has the red channel darkened for visual purposes.

10th Annual IFRB Retreat, 2016

The 10th Annual IFRB Retreat was held on October 21, 2016 in conjunction with the 22nd Annual Dr. Raymond O. Berry Memorial Lecture. Over 100 IFRB faculty and trainees from the Colleges of Veterinary Medicine & Biomedical Sciences and Agriculture and Life Sciences, College of Medicine, and Prairie View A&M plus guests participated in the Retreat

which was held at the Navasota Civic Center, Navasota, TX. **Dr. Chuck Long, Chair of the IFRB,** presided over the meeting.

Organizers of the retreat were Drs. Gary Newton from Prairie View A&M and **Greg Johnson,** Vet-



erinary Integrative Biosciences.

Minisymposia were presented by IFRB Faculty: **Dr. Nancy Ing,** "RNAs in stallion sperm: Towards development of a novel assay for male fertility."

Dr. Sakhila Banu, "Early exposure to the Erin Brockovich chemical (CrVI) lead to placental perturbation."

Presenters at the "Data Blitz" section of the Retreat program included: **Christine Fig-gener,** "The basis and consequences of female alternative reproductive tactics in sea turtles."

Richard Chang, "Paternal alcohol consumption restricts growth and alters developmental programming in offspring."

Meaghan O'Neil, "The role of estradiol-17 β in modulating pituitary-ovarian responsiveness to GnRH in winter anovulatory mares."

Raine Lunde, "Chronic binge alcohol con-

sumption during pregnancy alters rat maternal uterine artery pressure response." **Katie Beason,** "Metabolic and hormonal differences in nutrient restricted ewes having SGA and non-GA fetuses." **Stephanie Wal-bornn,** "The effect of dual hemisphere breeding on stallion fertility."

Support for the 9th Annual IFRB Retreat and Dr. Raymond O. Berry Memorial Lecture was provided by **Dr. Eleanor E. Green,** College of Veterinary Medicine & Biomedical Sciences, **Dr. Alan Sams,** College of Agriculture and Life Sciences, **Dr. Alton Johnson,** College of Agriculture, Prairie View A&M University, **Dr. Evelyn Tiffany-Castiglioni,** Department of Veterinary Integrative Biosciences, **Dr. H. Russell Cross,** Department of Animal Science, **Dr. Larry Suva,** Department of Veterinary Physiology and Pharmacology, **Dr. William Grif-**

fith, Department of Neuroscience and Experimental Therapeutics, **Dr. Geoffrey Kapler,** Department of Molecular and Cellular Therapeutics, College of Medicine, and **Dr. Fuller Bazer,** through his Distinguished Professor account.



IRFB Faculty Activities, Awards, etc.

November, 2016
Biology of Reproduction journal cover highlighting the paper by X. Wang, D. Li, G. Wu and F. W. Bazer, Functional Roles of Fructose: Crosstalk between O-Linked Glycosylation and Phosphorylation of Akt-TSC2-MTOR Cell Signaling Cascade in Ovine Trophectoderm Cells.

BIOLOGY of REPRODUCTION



In the same issue papers from Greg Johnson's Lab and Qinglei Li's lab were also published:

C. Steinhauser, M. Landers, L. Myatt, R. Burghardt, J. Vallet, F.W. Bazer and G. Johnson, Fructose Synthesis and Transport at the Uterine-Placental Interface of Pigs: Cell-Specific Localization of SLC2A5, SLC2A8, and Components of the Polyol Pathway.

X. Fang, Y Gao, and Qi. Li, SMAD3 Activation: A Converging Point of Dysregulated TGF-Beta Superfamily Signaling and Genetic Aberrations in Granulosa Cell Tumor Development?

NEW GRANTS:

***Dr. Jay Ramadoss**, coordinator and **Fuller Bazer, Katrin Hinrichs, Larry Suva, and Jim Herman**, received a Tier One Program Grant on "Collaborative Learning Initiatives in Maternal, Perinatal, and Infant Health Research," 09/01/2016-08/31/2019, \$288,000.



***SA Meyers and Dickson Varner**, American Quarter Horse Foundation "Mitochondrial oxidative function of stallion sperm is a novel indicator of



aging and cryopreservation success in stallions." 2016-2017, \$58,913. RJ Aiken, Z Gibb, D.D. Varner, Australian Research Council, "Enhancing fertility for the Thoroughbred and Standardbred industries." 2016-2020, \$560,000.

AWARDS & HONORS:

***Dr. Kayla Bayless** served participated in the Atherosclerosis, Inflammation, and Cardiovascular Sciences Study sections February 4-5th in Bethesda, MD, and September 29-30th in Potomac, MD.

Dr. Bayless also participated in an American Heart Association Peer Review Group, Vascular Wall Biology Basic Science 3 Committee on October, 2016.

***Dr. Fuller Bazer** received the following awards:

Centenary College of Louisiana Alumni Hall of Fame Inductee, Shreveport, LA (2016).

Colegio Brasileiro de Reproducao Animal Award for Outstanding Contributions to Reproductive Biology, Campos do Jordao, Brazil, November, 2016.



***Dr. Kathrin Dunlap** was recognized with the Honor Professor Award presented by the TAMU College of Agriculture and Life Sciences.



***Dr. Greg Johnson** was elected to the Board of Directors for the Society for the Study of Reproduction, 2016. He also received an "Excellence in Reviewing," outstanding contribution to the quality of the Journal *Placenta*.

Dr. Johnson was a Co-Organizer for the Twenty Second Annual Dr. Raymond O. Berry Memorial Lecture and Tenth Annual Interdisciplinary Faculty of Reproductive Biology (IRFB) Retreat, 2016.

***Dr. Qinglei Li** served as an ad hoc reviewer for two agencies including:
- The Department of Defense Ovarian Cancer Research Program (OCRP) Integration Panel and
- The Israel Science Foundation (ISF), 2016.

***Dr. Jay Ramadoss**, received the 2016 Juan Carlos Robles Emanuelli Teaching Award from the TAMU College of Veterinary Medicine & Biomedical Sciences (CVM). He also received the 2016 Outstanding Young Faculty Research Award from the CVM, TAMU.

***Dr. Ramadoss** served on the following NIH Review Panels:
- Ad hoc Reviewer, NIH PN Pregnancy and Neonatology Study Section (February, 2016)

- Reviewer, NIH ZRGI EMNR-A (55) R, Translational Research in Pediatric and Obstetric Pharmacology and Therapy (April 2016)
- Reviewer, NIH NIGMS Centers of Biomedical Research Excellence (COBRE) Award Program for COBRE-Phase I (P20) special emphasis panel (July, 2016)
- Reviewer, NIH 2016/10 ZAAI JJ Special Emphasis Panel (July, 2016)

***Dr. Dickson Varner** received the 2016 Bartlett Award for Lifetime Achievement in Theriogenology, awarded by the Society for Theriogenology and American College of Theriogenologists.

***Dr. Carey Satterfield** received the 2016 American Society of Animal Sciences Early Career Achievement Award.



***Dr. Tom Welsh, Jr.**, was recipient of 2016 ASAS Physiology & Endocrinology Award (presented at 2016 ASAS-



ADSA meeting in Salt Lake City, Utah).

<http://takingstock.asas.org/?p=20220>
INTERNATIONAL ACTIVITIES:

***Dr. Sakhila Banu** gave a talk at the University of Madras, India entitled, Chromium Toxicity and Premature Ovarian Failure" on June 8, 2016.



***Dr. Fuller Bazer** presented the following invited lectures:
"Pregnancy in ruminants: Viral and antiviral aspects during pregnancy" at Queen's University for the Anne Croy Retirement Symposium, the July 28-29, 2016, Kingston, Ontario,
"Effects of agmatine on secretion of interferon tau and catecholamines and expression of genes related to production of polyamines by ovine trophoblast cells" at the Fourth International Symposium on Polyamines, Biochemical, Physiological and Clinical Perspectives, September 4-9, 2016, Rome, Italy;
"Pregnancy recognition signals in mammals: The roles of interferons and estrogens at the VI International Symposium on Animal Biology of Reproduction, November 5-9, 2016, Campos do Jordao, Brazil.

(continued on page 16)

- ates oxidative stress in weaned piglets challenged with hydrogen peroxide. *Amino Acids*. 2016 Jan;48(1):53-64.
- Duran CL, Lee DW, Jung JU, Ravi S, Pogue CB, Toussaint LG, Bayless KJ, Sitcheran R. NIK regulates MT1-MMP activity and promotes glioma cell invasion independently of the canonical NF- κ B pathway. *Oncogenesis*. 2016 Jun 6;5(6):e231.
- Dutta EH, Behnia F, Boldogh I, Saade GR, Taylor BD, Kacerovský M, Menon R. Oxidative stress damage-associated molecular signaling pathways differentiate spontaneous preterm birth and preterm premature rupture of the membranes. *Mol Hum Reprod*. 2016 22(2):143-57.
- Earnest DJ, Neuendorff N, Coffman J, Selvamani A, Sohrabji F. Sex differences in the impact of shift work schedules on pathological outcomes in an animal model of ischemic stroke. *Endocrinology*. 2016 Jul;157(7):2836-43.
- Falco F, Barra M, Cammarata M, Cuttitta A, Jia S, Bonanno A, Mazzola S, Wu G. Amino acid composition in eyes from zebrafish (*Danio rerio*) and sardine (*Sardina pilchardus*) at the larval stage. *Springerplus*. 2016 Apr 26;5:519.
- Fang X, Gao Y, Li Q. SMAD3 activation: A converging point of dysregulated TGF-beta superfamily signaling and genetic aberrations in granulosa cell tumor development? *Biol Reprod*. 2016 Nov;95(5):105.
- Galea LA, Frick KM, Hampson E, Sohrabji F, Choleris E. Why estrogens matter for behavior and brain health. *Neurosci Biobehav Rev*. 2016 Mar 31. pii: S0149-7634(16)30023-9. doi: 10.1016/j.neubiorev.2016.03.024. [Epub ahead of print]
- Gao Y, Vincent DF, Davis AJ, Sansom OJ, Bartholin L, Li Q. Constitutively active transforming growth factor β receptor 1 in the mouse ovary promotes tumorigenesis. *Oncotarget*. 2016 Jul 5;7(27):40904-40918.
- Gart EV, Suchodolski JS, Welsh TH Jr, Alaniz RC, Randel RD, Lawhon SD. Salmonella typhimurium and multidirectional communication in the gut. *Front Microbiol*. 2016 Nov 22;7:1827.
- Garza-Brenner E, Sifuentes-Rincón AM, Randel RD, Paredes-Sánchez FA, Parra-Bracamonte GM, Arellano Vera W, Rodríguez Almeida FA, Segura Cabrera A. Association of SNPs in dopamine and serotonin pathway genes and their interacting genes with temperament traits in Charolais cows. *J Appl Genet*. 2016 Dec 16. [Epub ahead of print]
- Godugu C, Doddapaneni R, Safe SH, Singh M. Novel diindolylmethane derivatives based NLC formulations to improve the oral bioavailability and anticancer effects in triple negative breast cancer. *Eur J Pharm Biopharm*. 2016 Nov;108:168-179.
- Girijala RL, Sohrabji F, Bush RL. Sex differences in stroke: Review of current knowledge and evidence. *Vasc Med*. 2016 Nov 3. pii: 1358863X16668263. [Epub ahead of print]
- Goldberg AA, Draz H, Montes-Grajales D, Olivero-Verbel J, Safe SH, Sanderson JT. Erratum: 3,3'-Diindolylmethane (DIM) and its ring-substituted halogenated analogs (ring-DIMs) induce differential mechanisms of survival and death in androgen-dependent and-independent prostate cancer cells. *Genes Cancer*. 2016 Jan;7(1-2):59.
- Guizzetti M, Davies DL, Egli M, Finn DA, Molina P, Regunathan S, Robinson DL, Sohrabji F. Sex and the Lab: An Alcohol-Focused Commentary on the NIH Initiative to Balance Sex in Cell and Animal Studies. *Alcohol Clin Exp Res*. 2016 Jun;40(6):1182-91.
- Haggerty CL, Totten PA, Tang G, Astete SG, Ferris MJ, Norori J, Bass DC, Martin DH, Taylor BD, Ness RB. Identification of novel microbes associated with pelvic inflammatory disease and infertility. *Sex Transm Infect*. 2016 Sep;92(6):441-6.
- He X, Duan Y, Yao K, Li F, Hou Y, Wu G, Yin Y. β -Hydroxy- β -methylbutyrate, mitochondrial biogenesis, and skeletal muscle health. *Amino Acids*. 2016 Mar;48(3):653-64.
- Hedrick E, Li X, Safe S. Penfluridol represses integrin expression in breast cancer through induction of reactive oxygen species and downregulation of Sp transcription factors. *Mol Cancer Ther*. 2016 Nov 3. pii: molcanther.0451.2016. [Epub ahead of print]
- Hedrick E, Cheng Y, Jin UH, Kim K, Safe S. Specificity protein (Sp) transcription factors Sp1, Sp3 and Sp4 are non-oncogene addiction genes in cancer cells. *Oncotarget*. 2016 Apr 19;7(16):22245-56.
- Hedrick E, Lee SO, Doddapaneni R, Singh M, Safe S. NR4A1 Antagonists inhibit β 1-integrin-dependent breast cancer cell migration. *Mol Cell Biol*. 2016 Apr 15;36(9):1383-94.
- Hesser A, Darr C, Gonzales K, Power H, Scanlan T, Thompson J, Love C, Christensen B, Meyers S. Semen evaluation and fertility assessment in a purebred dog breeding facility. *Theriogenology*. 2017 Jan 1;87:115-123.
- Hinrichs K. A journey through people, places, and projects in equine assisted reproduction. *Theriogenology*. 2016 Jul 1;86(1):1-10.
- Hinrichs K, Choi YH. Micromanipulation of equine blastocysts to allow vitrification. *Reprod Fert Dev*. 2016 Feb 25. doi: 10.1071/RD15389. [Epub ahead of print]
- Hou Y, Hu S, Jia S, Nawaratna G, Che D, Wang F, Bazer FW, Wu G. Whole-body synthesis of L-homoarginine in pigs and rats supplemented with L-arginine. *Amino Acids*. 2016 Apr;48(4):993-1001.
- Howell DW, Duran CL, Tsai SP, Bondos SE, Bayless KJ. Functionalization of ultrathin thorax materials with vascular endothelial growth factor enhances angiogenic activity. *Biomacromolecules*. 2016 Nov 14;17(11):3558-3569.
- Ingleby SJ, Rosenthal GG. Digest: Mechanisms of assortative mating and ecological speciation. *Evolution*. 2016 doi: 10.1111/evo.13132.
- Jeong W, Jung S, Bazer FW, Song G, Kim J. Epidermal growth factor: Porcine uterine luminal epithelial cell migratory signal during the peri-implantation period of pregnancy. *Mol Cell Endocrinol*. 2016 Jan 15;420:66-74.
- Jeong W, Bazer FW, Song G, Kim J. Expression of hypoxia-inducible factor-1 by trophoblast cells in response to hypoxia and epidermal growth factor. *Biochem Biophys Res Commun*. 2016 Jan 8;469(2):176-82.
- Jeong W, Lee J, Bazer FW, Song G, Kim J. Fibroblast growth factor 4-induced migration of porcine trophoblast cells is mediated via the AKT cell signaling pathway. *Mol Cell Endocrinol*. 2016 ;419:208-16.
- Jeong W, Kim J, Bazer FW, Song G, Kim J. Stimulatory effects of interleukin-1 beta on development of porcine uterine epithelial cell are mediated by activation of the ERK1/2 MAPK cell signaling cascade. *Mol Cell Endocrinol*. 2016 Jan 5;419:225-34.
- Ji Y, Wu Z, Dai Z, Sun K, Zhang Q, Wu G. Excessive L-cysteine induces vacuole-like cell death by activating endoplasmic reticulum stress and mitogen-activated protein kinase signaling in intestinal porcine epithelial cells. *Amino Acids*. 2016 Jan;48(1):149-56.
- Ji Y, Wu Z, Dai Z, Sun K, Wang J, Wu G. Nutritional epigenetics with a focus on amino acids: implications for the development and treatment of metabolic syndrome. *J Nutr Biochem*. 2016 Jan;27:1-8.
- Johnson SA, Javurek AB, Painter MS, Ellersieck MR, Welsh TH Jr, Camacho L, Lewis SM, Vanlandingham MM, Ferguson SA, Rosenfeld CS. Effects of developmental exposure to bisphenol A on spatial navigational learning and memory in rats: A CLARITY-BPA study. *Horm Behav*. 2016 Apr;80:139-48.
- Jones RA, Cohn WB, Wilkes AA, MacKenzie DS. Negative feedback regulation of thyrotropin subunits and pituitary deiodinases in red drum, *Sciaenops ocellatus*. *Gen Comp Endocrinol*. 2017 Jan 1;240:19-26



Faculty Spotlight, Dr. Williams (cont'd from page 8)

(GNIH), has received attention as a potential regulator of gonadotropin secretion and seasonal breeding in both avian and mammalian species. However, as a result of work reported in the mare from the Williams lab by Jenny Thorson (**Figure 4**) and in the ewe by the French group at INRA, the functionality of RFRP3 and its role in controlling seasonality of the mare and the ewe is now considered unlikely.

Synchronization of ovulation for fixed-time AI in *Bos indicus*-influenced cattle. The final area of current focus in the Williams laboratory has been to develop successful and efficient protocols for synchronization of ovulation and fixed-time AI in *Bos indicus*-influenced cattle. Research conducted by Williams' group during the last 10 years and supported by Pfizer Animal Health, Zoetis Animal Health, Select Sires and Texas A&M AgriLife, has resulted in significant progress in the development of improved synchronization methodologies for *Bos indicus*-influenced cattle. Specifically, the development of the 5-day Bee Synch + CIDR (Bee Synch) procedure has resulted for the first time in average fixed-time insemination pregnancy rates of > 50% in these types of cattle. This protocol, referred to nationally in the Beef Sire Directories as PG-5-day-Co-Synch + CIDR, is now the only nationally-recommended approach for synchronization of ovulation for fixed-time AI of *Bos indicus*-influenced cattle. A modified version of Bee Synch (Bee Synch II) has now been developed that shows equal efficacy but reduces costs per cow by approximately \$5.00/head. ***

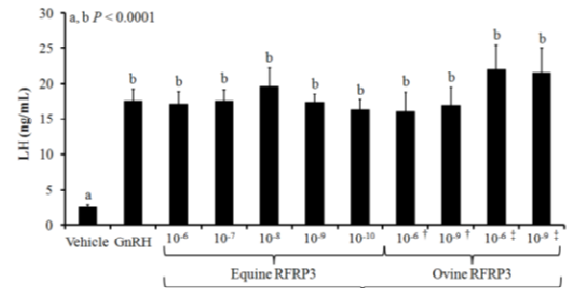


Figure 4. Luteinizing hormone concentrations in culture media collected from adenohypophyseal cell cultures of winter anovulatory mares (Exp. 3) treated with vehicle (media only), GnRH (10⁻⁸ M) or GnRH (10⁻⁸ M) plus increasing doses of either equine RFRP3 (Auspep Pty, Ltd) or one of two ovine RFRP3 preparations (†, ‡). Mares had been treated continuously with GnRH (100 µg/h) for 12-18 d before euthanasia and tissue collection to stimulate synthesis of LH by gonadotropes. Treatment with GnRH stimulated ($P < 0.0001$) secretion of LH in all cases compared to vehicle control but none of the RFRP3 preparations suppressed this response. Thorson et al., 2014; *Biol. Reprod.* 90: 28, 1-9. Diagram of glucose and fructose transport from the maternal to fetal vasculature. Epithelial placentation in the pig requires that nutrients pass through multiple

Dr. Katrin Hinrichs

2016 Simmet Prize for Animal Reproduction

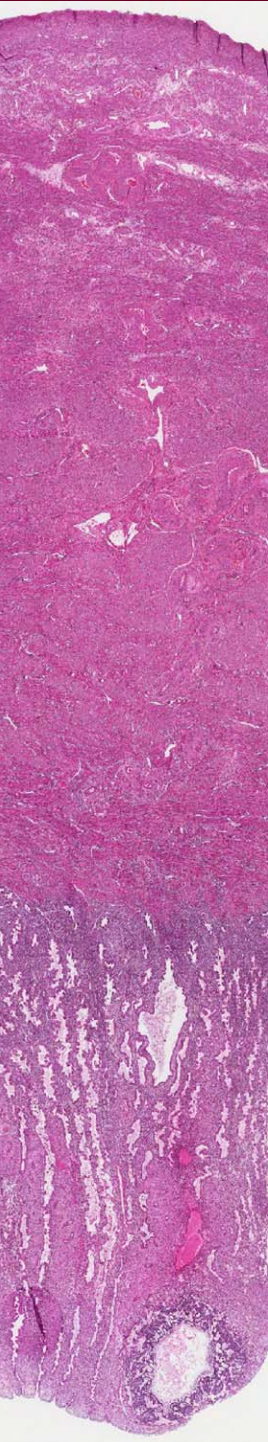
The International Congress on Animal Reproduction (ICAR) announced that Dr. Katrin Hinrichs was the recipient of the 2016 Simmet Prize for Assisted Reproduction. The prize, which is the most prestigious award in animal reproduction and one of the largest of its kind, was awarded based on the pioneering efforts of Dr. Hinrichs to elucidate the fundamental biology of gametes and embryos in the horse and to develop laboratory techniques that have made assisted reproduction technologies in the horse a practical reality. The clinical program in equine assisted reproduction she founded in 2009 in collaboration with the Section of Theriogenology at Texas A&M is now one of the largest in the world and has performed over 450 embryo production procedures in 2015 alone.



She and her colleagues have been instrumental in the development of assisted reproductive techniques in the horse. Areas in which Dr. Hinrichs and colleagues have made instrumental advances include in vitro maturation of eggs, fertilization by intra-cytoplasmic sperm injection, embryo culture, cloning, cryopreservation of embryos and the use of embryonic biopsy to enable pre-implantation genetic screening.

The prize, established as a memorial to the accomplishments of Dr. Ludwig Simmet, a pioneer in development of artificial insemination in farm animals and founder of Minitube, recognizes an active research scientist for basic and

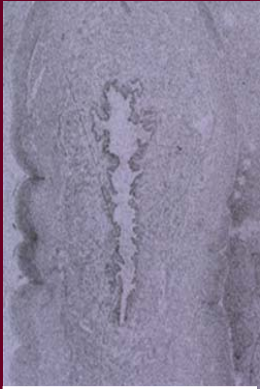
applied research published during the previous six years in the area of assisted reproduction of animals. The prize is presented each 4 years and includes an award of 50,000 euros.



Human implantation site, Day 12-15 postovulation

- Kasiappan R, Jutooru I, Karki K, Hedrick E, Safe SH. Benzylisothiocyanate (BITC) Induces ROS-dependent Repression of STAT3 by Downregulation of Specificity Proteins in Pancreatic Cancer. *J Biol Chem.* 2016 Nov 15. pii: jbc.M116.746339.
- Kelleher AM, Burns GW, Behura S, Wu G, Spencer TE. Uterine glands impact uterine receptivity, luminal fluid homeostasis and blastocyst implantation. *Sci Rep.* 2016 Dec 1;6:38078.
- Lacey A, Rodrigues Hoffman A, Safe S. PAX3-FOXO1A expression in rhabdomyosarcoma is driven by the targetable nuclear receptor NR4A1. *Cancer Res.* 2016 Nov 18. pii: canres.1546.2016. Lacey A, Hedrick E, Li X, Patel K, Doddapaneni R, Singh M, Safe S. Nuclear receptor 4A1 (NR4A1) as a drug target for treating rhabdomyosarcoma (RMS). *Oncotarget.* 2016 May 24;7(21):31257-69.
- Lee J, Banu SK, McCracken JA, Arosh JA. Early pregnancy modulates survival and apoptosis pathways in the corpus luteum in sheep. *Reproduction.* 2016 Mar;151(3):187-202.
- Lenis YY, Wang X, Tang W, Wu G, Bazer FW. Effects of agmatine on secretion of interferon tau and catecholamines and expression of genes related to production of polyamines by ovine trophoblast cells. *Amino Acids.* 2016 Oct;48(10):2389-99.
- Li H, Meininger CJ, Bazer FW, Wu G. Intracellular sources of ornithine for polyamine synthesis in endothelial cells. *Amino Acids.* 2016 Oct;48(10):2401-10.
- Li W, Zou J, Yue F, Song K, Chen Q, McKeehan WL, Wang F, Xu G, Huang H, Yi J, Liu L. Defects in MAP1S-mediated autophagy cause reduction in mouse lifespans especially when fibronectin is overexpressed. *Aging Cell.* 2016 Apr;15(2):370-9.
- Li W, Sun K, Ji Y, Wu Z, Wang W, Dai Z, Wu G. Glycine Regulates Expression and Distribution of Claudin-7 and ZO-3 Proteins in Intestinal Porcine Epithelial Cells. *J Nutr.* 2016 May;146(5):964-9.
- Lim W, Bae H, Bazer FW, Song G. Functional roles of Eph A-Ephrin A1 system in endometrial luminal epithelial cells during early pregnancy. *J Cell Physiol.* 2016 Oct 24. doi: 10.1002/jcp.25659. Lim W, Yang C, Bazer FW, Song G. Chrysophanol induces apoptosis of choriocarcinoma through regulation of ROS and the AKT and ERK1/2 pathways. *J Cell Physiol.* 2017 Feb;232(2):331-339.
- Lim W, Yang C, Park S, Bazer FW, Song G. Inhibitory effects of quercetin on progression of human choriocarcinoma cells are mediated through PI3K/AKT and MAPK signal transduction cascades. *J Cell Physiol.* 2016 Oct 7. doi: 10.1002/jcp.25637.
- Lim W, Park S, Bazer FW, Song G. Naringenin-induced apoptotic cell death in prostate cancer cells is mediated via the PI3K/AKT and MAPK signaling pathways. *J Cell Biochem.* 2016 Sep 8. doi: 10.1002/jcb.25729. [Epub ahead of print]
- Lim W, Jeong M, Bazer FW, Song G. Curcumin suppresses proliferation and migration and induces apoptosis on human placental choriocarcinoma cells via ERK1/2 and SAPK/JNK MAPK signaling pathways. *Biol Reprod.* 2016 Aug 31. pii: biolreprod.116.141630. Lim W, Yang C, Bazer FW, Song G. Luteolin inhibits proliferation and induces apoptosis of human placental choriocarcinoma cells by blocking the PI3K/AKT pathway and regulating sterol regulatory element binding protein activity. *Biol Reprod.* 2016 Oct;95(4):82.
- Lim W, Jeong M, Bazer FW, Song G. Coumestrol inhibits proliferation and migration of prostate cancer cells by regulating AKT, ERK1/2, and JNK MAPK cell signaling cascades. *J Cell Physiol.* 2017 Apr;232(4):862-871.
- Lim W, Park S, Bazer FW, Song G. Apigenin reduces survival of choriocarcinoma cells by inducing apoptosis via the PI3K/AKT and ERK1/2 MAPK pathways. *J Cell Physiol.* 2016 Dec;231(12):2690-9.
- Li X, Wang C, Xiao J, McKeehan WL, Wang F. Fibroblast growth factors, old kids on the new block. *Semin Cell Dev Biol.* 2016 May;53:155-67.
- Li Y, Xiao W, Luo W, Zeng C, Deng Z, Ren W, Wu G, Lei G. Alterations of amino acid metabolism in osteoarthritis: its implications for nutrition and health. *Amino Acids.* 2016 Apr;48(4):907-14.
- Littlejohn BP, Price DM, Banta JP, Lewis AW, Neuendorff DA, Carroll JA, Vann RC, Welsh TH, Randel RD. Prenatal transportation stress alters temperament and serum cortisol concentrations in suckling Brahman calves. *J Anim Sci.* 2016 Feb;94(2):602-9.
- Liu Y, Kong X, Li F, Tan B, Li Y, Duan Y, Yin Y, He J, Hu C, Blachier F, Wu G. Co-dependence of genotype and dietary protein intake to affect expression on amino acid/peptide transporters in porcine skeletal muscle. *Amino Acids.* 2016 Jan;48(1):75-90.
- Loughran AJ, Gaddy D, Beenken KE, Meeker DG, Morello R, Zhao H, Byrum SD, Tackett AJ, Cassat JE, Smeltzer MS. Impact of sarA and phenol-soluble modulins on the pathogenesis of osteomyelitis in diverse clinical isolates of *Staphylococcus aureus*. *Infect Immun.* 2016 Aug 19;84(9):2586-94.
- Love CC. Modern techniques for semen evaluation. *Vet Clin North Am Equine Pract.* 2016 Dec;32(3):531-546.
- Lu C, Cardoso RC, Puttabyatappa M, Padmanabhan V. Developmental programming: Prenatal testosterone excess and insulin signaling disruptions in female sheep. *Biol Reprod.* 2016 May;94(5):113.
- Lunde ER, Washburn SE, Golding MC, Bake S, Miranda RC, Ramadoss J. Alcohol-induced developmental origins of adult-onset diseases. *Alcohol Clin Exp Res.* 2016 Jul;40(7):1403-14.
- Makhoul I, Montgomery CO, Gaddy D, Suva LJ. The best of both worlds - managing the cancer, saving the bone. *Nat Rev Endocrinol.* 2016 Jan;12(1):29-42.
- Martinez B, Soñanez-Organis JG, Viscarra JA, Jaques JT, MacKenzie DS, Crocker DE, Ortiz RM. Glucose delays the insulin-induced increase in thyroid hormone-mediated signaling in adipose of prolonged-fasted elephant seal pups. *Am J Physiol Regul Integr Comp Physiol.* 2016 Mar 15;310(6):R502-12.
- Miller L, Marks C, Becker J, Hurn P, Chen W, Woodruff T, McCarthy M, Sohrabji F, Schiebinger L, Wetherington C, Makris S, Arnold A, Einstein G, Miller V, Sandberg K, Maier S, Cornelison T, Clayton J. Considering sex as a biological variable in preclinical research. *FASEB J.* 2016 Sep 28. pii: fj.201600781R.
- Moore RW, Fritz WA, Schneider AJ, Lin TM, Branam AM, Safe S, Peterson RE. 2,3,7,8-Tetrachlorodibenzo-p-dioxin has both pro-carcinogenic and anti-carcinogenic effects on neuroendocrine prostate carcinoma formation in TRAMP mice. *Toxicol Appl Pharmacol.* 2016 Aug 15;305:242-9.
- Naik, VD, Lunde-Young, ER, Davis-Anderson KL, Orzabal M, Ivanov I, Ramadoss J. Chronic binge alcohol consumption during pregnancy alters rat maternal uterine artery pressure response. *Alcohol.* 2016 vol. 56 pp. 59-64.
- Nathanielsz P, Yan J, Green R, Nijland M, Miller JW, Wu G, McDonald TJ, Caudill MA. Maternal obesity disrupts the methionine cycle in baboon pregnancy. *Physiol Rep.* 2015 Nov;3(11). pii: e12564.
- Nation K, Birge A, Lunde E, Cudd T, Goodlett C, Washburn S. Video-based data acquisition system for use in eye blink classical conditioning procedures in sheep. *Behav Res Methods.* 2016 Nov 4.
- O'Connell AR, McNatty KP, Hurst PR, Spencer TE, Bazer FW, Reader KL, Johnstone PD, Davis GH, Juengel JL. Activin A and follistatin during the oestrous cycle and early pregnancy in ewes. *J Endocrinol.* 2016 Mar;228(3):193-203.

Faculty Activities, cont'd from page 12



In situ hybridization showing distinct localization of mRNA for the fructose transporter SLC2A8 in luminal epithelium (LE) and conceptus troph-ectoderm (Tr) on Days 15 (top) and 20 (bottom) of pregnancy in pigs. Image provided by Drs. Chelsie Steinhouser and Greg Johnson.

***Dr. Katrin Hinrichs** presented an invited lecture, "A journey through people, places, and projects in equine assisted reproduction" Simmet Prize Lecture, International Congress on Animal Reproduction, Tours, France, June 27, 2016.

***Dr. Greg Johnson** was Keynote Speaker at the 1st International Symposium, Creation and Future Trends in Food and Agricultural Immunology, Sendai, Japan. The title was "Inflammatory cytokines osteopontin and interferon gamma physically and functionally modify the uterus and placenta to support pregnancy." He was also Keynote Speaker at Erdos, Inner Mongolia, China, "Molecular, cellular and physiological interactions between the placenta and uterus during sheep pregnancy."

INVITED LECTURES

***Dr. Kayla Bayless**, was an invited speaker to the 15th Biennial Meeting of the International Society of Applied Cardiovascular Biology held September 7-10th in Banff, Alberta, CA. The talk was entitled, "Ultrathorax-based biomaterials enhance endothelial activation and neovascularization." David Howell, Camille Duran, and Sarah Bondos were co-authors on the study. The platform presentation was included in an Emerging Technologies session and was co-sponsored by the American Society of Matrix Biology. She attended two other meetings: 1) the International Vascular Biology meeting in Boston, MA from Oct. 30-Nov. 3 and chaired the session on Endothelial Cells. 2) The American Society for Matrix Biology Biennial Meeting in St. Petersburg, FL from Nov. 13-16.

***Dr. Sakhila Banu**, gave an invited lecture at the University of Texas Medical Branch, Galveston, on January 9, 2016 entitled, "Prenatal CrVI Exposure and Premature Ovarian Failure: A DoHAD Perspective." She also gave an invited lecture entitled, "Chromium VI-Induced Reproductive Toxicity: Mechanisms and Inter-

vention" at the 6th Global Summit on Toxicology and Applied Pharmacology, Houston TX, on Oct. 17, 2016.

***Dr. Fuller Bazer**, presented an invited lecture "The Many Faces of Interferon Tau" to faculty and trainees at Iowa State University, Ames, Iowa, Feb. 10-12, 2016. He also presented an invited symposium lecture entitled, "Interferon Tau: Roles in Establishing and Maintaining Pregnancy" for the Society for the Study of Reproduction at the 49th annual meeting, San Diego, CA, July 16-18, 2016.

***Dr. Gary Williams**, presented invited lectures entitled "Reproductive Seasonality in the Mare: Neuroendocrine Basis and Pharmacologic Control" for the Society for Theriogenology, College of Veterinary Medicine & Biomedical Sciences, TAMU, Feb. 5, 2016 and "Synchronization of Ovulation for Fixed-Time AI in Bos indicus-influenced cattle using Bee Synch" for the South Texas Hereford Association, February 2016, Beeville, TX.

***Dr. Greg Johnson** was again invited to serve as a faculty member in the 2016, Frontiers in Reproduction course at the Marine Biological Laboratories, Woods Hole, MA, 30 April-12 June 2016. He presented lectures on placentation in domestic animals.

***Dr. Dickson Varner** was invited speaker at the following symposia: - West Coast Equine Reproduction Symposium V, Buelton and Los Olivos, California. "Handling the Breeding Stallion" and "Processing Semen for Cooled Transport." Nov. 3-5, 2016.

- Reproductive Diseases in Horses Symposium, Lexington, Kentucky. "Pathology of the Stallion Reproductive Tract (Penis, Prepuce, Semen)." Nov. 19, 2016.

- International Symposium on Equine Reproduction, Champaign-Urbana, Illinois, "Approaches to Breeding Soundness Examination and Interpretation of Results"

- International Symposium on Equine Reproduction, Champaign-Urbana, IL, "Emerging Diagnostic Methods for Assessing Sperm Quality and their Relationship with Fertility."

IFRB Trainee News, cont'd from page 10

Egypt and Belgium before joining the Equine Embryo Laboratory with **Dr. Katrin Hinrichs** in November, 2016 as a Research Assistant. Dr. Resende is working on the role of reactive oxygen species in stallion sperm capacitation, as well as on transvaginal follicle aspiration and oocyte manipulation in the mare.

***Dr. Rosanna Serafini** is a Postdoctoral Research Associate in the Stallion Reproductive Studies (SRS) Laboratory, Section of Theriogenology, at the CVM. She received her DVM in 2007 and PhD in 2015 from University of Naples, Italy. During her PhD she conducted a collaborative research on sperm quality and fertility, and developed a research project focused on the Comet assay in stallion, bull and water buffalo sperm. Part of this project was developed at the TAMU SRS Laboratory. She returned to Texas and has continued to expand her interest in stallion reproduction, including sperm DNA assays and sperm function. Her interest, during the first year of her Postdoc, focused on the effect of seminal plasma on sperm DNA, creating a model by using potentiators of DNA damage to better understand the response of the different DNA assays. She was also involved in a project on antioxidant enzymes in equine seminal plasma and her goal is to improve sperm function, particularly under storage conditions.

AWARDS AND GRADUATES

***Anita Snell** completed her M.S. Thesis in August, 2016 entitled "Effect of monensin supplementation on follicular development of Brahman cows and the effect of sex and temperament on response of beef calves to Salmonella Newport Extract vaccine". Co-Chairs were **Drs. Jason Banta, Ron Randel, and Tom Welsh**. Anita was a Texas A&M AgriLife Extension Assistant and served as a graduate and teaching assistant in the Department of Animal Science. Anita is now a Beef and Livestock Specialist for the University of Missouri Extension Service in Milan, MO.

***Dr. Katie Davis-Anderson**, postdoctoral fellow in **Dr. Ramadoss'** lab received a Research Society on Alcoholism Junior Investigator Award.

***Heewon Seo**, postdoctoral fellow in the laboratory of **Dr. Greg A. Johnson**, received a USDA-NIFA-AFRI Merit award at the 49th Annual Meeting of the Society for the Study of Reproduction, San Diego, July 2016 where he was also a finalist in the Trainee Research Award Competition. The title of his platform presentation was "Syncytial Trophoblast Fusion and Breaching of Uterine Luminal Epithelium in Sheep."

(continued on page 20, top-right column)



- Padmanabhan V, Cardoso RC, Puttabyatappa M. Developmental programming, a pathway to disease. *Endocrinology*. 2016 Apr;157(4):1328-40.
- Park MJ, Sohrabji F. The histone deacetylase inhibitor, sodium butyrate, exhibits neuroprotective effects for ischemic stroke in middle-aged female rats. *J Neuroinflammation*. 2016 Dec 1;13(1):300.
- Peters AE, Watts AE. Biopsy needle advancement during bone marrow aspiration increases mesenchymal stem cell concentration. *Front Vet Sci*. 2016 Mar 14;3:23.
- Pozor MA, Sheppard B, Hinrichs K, Kelleman AA, Macpherson ML, Runcan E, Choi YH, Diaw M, Mathews PM. Placental abnormalities in equine pregnancies generated by SCNT from one donor horse. *Theriogenology*. 2016 Oct 1;86(6):1573-82.
- Puttabyatappa M, Cardoso RC, Herkimer C, Veiga-Lopez A, Padmanabhan V. Developmental programming: postnatal estradiol modulation of prenatally organized reproductive neuroendocrine function in sheep. *Reproduction*. 2016 Aug;152(2):139-50.
- Puttabyatappa M, Cardoso RC, Padmanabhan V. Effect of maternal PCOS and PCOS-like phenotype on the offspring's health. *Mol Cell Endocrinol*. 2016 Nov 5;435:29-39.
- Rader K, Choi YH, Hinrichs K. Intracytoplasmic Sperm Injection, Embryo Culture, and Transfer of In Vitro-Produced Blastocysts. *Vet Clin North Am Equine Pract*. 2016 Dec;32(3):401-413.
- Ramírez-Carvajal L, Singh N, de los Santos T, Rodríguez LL, Long CR. Depletion of elongation initiation factor 4E binding proteins by CRISPR/Cas9 enhances the antiviral response in porcine cells. *Antiviral Res*. 2016 Jan;125:8-13.
- Reddy DS, Bhimani A, Kuruba R, Park MJ, Sohrabji F. Prospects of modeling poststroke epileptogenesis. *J Neurosci Res*. 2016 Jul 25. doi: 10.1002/jnr.23836. [Epub ahead of print]
- Reesink HL, Watts AE, Mohammed HO, Jay GD, Nixon AJ. Lubricin/proteoglycan 4 increases in both experimental and naturally occurring equine osteoarthritis. *Osteoarthritis Cartilage*. 2016 Aug 4. pii: S1063-4584(16)30214-X. doi: 10.1016/j.joca.2016.07.021. Regmi N, Wang T, Crenshaw MA, Rude BJ, Wu G, Liao SF. Effects of dietary lysine levels on plasma free amino acid profile in late-stage finishing pigs. *Springerplus*. 2016 Jun 24;5(1):888.
- Ren W, Yin J, Duan J, Liu G, Tan B, Yang G, Wu G, Bazer FW, Peng Y, Yin Y. mTORC1 signaling and IL-17 expression: Defining pathways and possible therapeutic targets. *Eur J Immunol*. 2016; 46(2):291-9.
- Ren W, Chen S, Zhang L, Liu G, Hussain T, Hao X, Yin J, Duan J, Tan B, Wu G, Bazer FW, Yin Y. Interferon Tau Affects Mouse Intestinal Microbiota and Expression of IL-17. *Mediators Inflamm*. 2016;2016:2839232.
- Ren W, Wang K, Yin J, Chen S, Liu G, Tan B, Wu G, Bazer FW, Peng Y, Yin Y. Glutamine-induced secretion of intestinal secretory immunoglobulin A: A mechanistic perspective. *Front Immunol*. 2016 Nov 24;7:503.
- Rezaei R, Wu Z, Hou Y, Bazer FW, Wu G. Amino acids and mammary gland development: nutritional implications for milk production and neonatal growth. *J Anim Sci Biotechnol*. 2016 Apr 2;7:20.
- Riera FL, Roldán JE, Gomez J, Hinrichs K. Factors affecting the efficiency of foal production in a commercial oocyte transfer program. *Theriogenology*. 2016 Apr 1;85(6):1053-62.
- Rosenthal GG. Mate choice: Charting desire's tangled bank. *Curr Biol*. 2016 Apr 4;26(7):R294-6.
- Ruebel M, Shankar K, Gaddy D, Lindsey F, Badger T, Andres A. Maternal obesity is associated with ovarian inflammation and upregulation of early growth response factor 1. *Am J Physiol Endocrinol Metab*. 2016 Jul 1;311(1):E269-77.
- Russell AN, Zheng X, O'Connell CM, Taylor BD, Wiesenfeld HC, Hillier SL, Zhong W, Darville T. Analysis of factors driving incident and ascending infection and the role of serum antibody in Chlamydia trachomatis genital tract infection. *J Infect Dis*. 2016 Feb 15;213(4):523-31.
- Russell AN, Zheng X, O'Connell CM, Wiesenfeld HC, Hillier SL, Taylor BD, Picard MD, Flechtner JB, Zhong W, Frazer LC, Darville T. Identification of Chlamydia trachomatis antigens recognized by t cells from highly exposed women who limit or resist genital tract infection. *J Infect Dis*. 2016 Dec 15;214(12):1884-1892.
- Safe S, Kasiappan R. Natural Products as Mechanism-based Anticancer Agents: Sp Transcription Factors as Targets. *Phytother Res*. 2016 Nov;30(11):1723-1732.
- Selvamani A, Sohrabji F. Mir363-3p improves ischemic stroke outcomes in female but not male rats. *Neurochem Int*. 2016 Oct 20. pii: S0197-0186(16)30179-6. doi: 10.1016/j.neuint.2016.10.008.
- Serafini R, Love CC, Coletta A, Mari G, Mislei B, Caso C, Di Palo R. Sperm DNA integrity in frozen-thawed semen from Italian Mediterranean Buffalo bulls and its relationship to in vivo fertility. *Anim Reprod Sci*. 2016 Sep;172:26-31.
- Schmitt EE, Vellers HL, Porter WW, Lightfoot JT. environmental endocrine disruptor affects voluntary physical activity in mice. *Med Sci Sports Exerc*. 2016 Jul;48(7):1251-8.
- Schumer M, Cui R, Powell DL, Rosenthal GG, Andolfatto P. Ancient hybridization and genomic stabilization in a swordtail fish. *Mol Ecol*. 2016 Jun;25(11):2661-79.
- Schumer M, Cui R, Rosenthal GG, Andolfatto P. simMSG: an experimental design tool for high-throughput genotyping of hybrids. *Mol Ecol Resour*. 2016 Jan;16(1):183-92.
- Shi M, Zhang Y, Liu L, Zhang T, Han F, Cleveland J, Wang F, McKeehan WL, Li Y, Zhang D. MAPIS protein regulates the phagocytosis of bacteria and Toll-like receptor (TLR) Signaling. *J Biol Chem*. 2016 Jan 15;291(3):1243-50.
- Sifuentes-Rincón AM, Trejo-Tapia AG, Randel RD, Ambriz-Morales P, Parra-Bracamonte GM. Bovine dopamine receptors DRD1, DRD4, and DRD5: genetic polymorphisms and diversities among ten cattle breeds. *Genet Mol Res*. 2016 Feb 22;15(1).
- Singh N, Ramirez-Carvajal L, de Los Santos T, Golding MC, Long CR. Inhibition of EHMT2 induces a robust antiviral response against foot-and-mouth disease and vesicular stomatitis virus infections in bovine cells. *J Interferon Cytokine Res*. 2016 Jan;36(1):37-47.
- Sohrabji F, Park MJ, Mahnke AH. Sex differences in stroke therapies. *J Neurosci Res*. 2017 Jan 2;95(1-2):681-691.
- Steinhauser CB, Bazer FW, Burghardt RC, Johnson GA. Expression of progesterone receptor in the porcine uterus and placenta throughout gestation: correlation with expression of uteroferrin and osteopontin. *Domest Anim Endocrinol*. 2017 Jan;58:19-29.
- Steinhauser CB, Landers M, Myatt L, Burghardt RC, Vallet JL, Bazer FW, Johnson GA. fructose synthesis and transport at the uterine-placental interface of pigs: Cell-specific localization of SLC2A5, SLC2A8, and components of the polyol pathway. *Biol Reprod*. 2016 Nov;95(5):108.
- Sun K, Wu Z, Ji Y, Wu G. glycine regulates protein turnover by activating protein kinase b/mammalian target of rapamycin and by inhibiting MuRF1 and atrogin-1 gene expression in C2C12 myoblasts. *J Nutr*. 2016 Dec;146(12):2461-2467.
- Suva LJ, Gaddy D. Back to the future: Evaluation of the role of glutamate in bone cells. *Calcif Tissue Int*. 2016 Aug;99(2):112-3.

Trainee Spotlight: Rui A. d' Orey Branco

Rui A. d' Orey Branco is a doctoral student co-mentored by Drs. Ron Randel and Tom Welsh. He has been an interactive student member of the IFRB program while he served as a graduate research and teaching assistant since Fall 2014. Rui has specific interests in controlling ovarian follicle development as a means to increase reproductive efficiency and improve delivery of animal sourced protein to a growing human population.

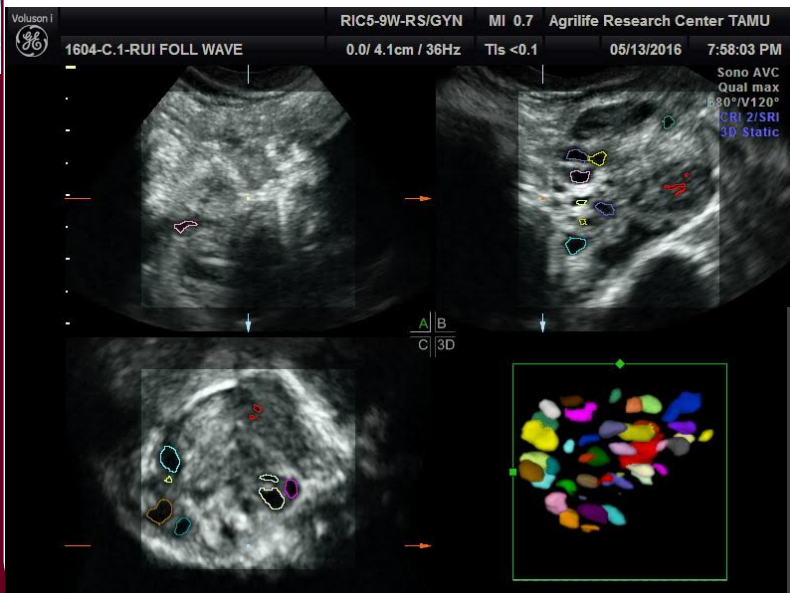
Rui was born Halloween, October 31, 1985 in his hometown of Vila Nova de Famalicão in Portugal. Through the stimuli of physical and mental exercises provided by his supportive parents, 4 siblings, and friends, young Rui developed 2 overarching, intertwined career interests: sports and academics. Specifically, Rui has actively pursued interests in rugby, veterinary medicine, and animal reproduction. The adolescent Rui moved to Lisbon, Portugal to pursue rugby and a college education. He played international rugby as a member (U17 and U19 teams) and captain (U20 team) of the National Team of Portugal. Subsequently, Rui was a professional rugby player on several teams that won the Portugal Cup and the Iberian Cup. The international rugby activities afforded Rui the opportunity for travel and cultural experiences across Europe and Africa. Animal biology attracted Rui's academic interests. In 2013 he earned the D.V.M. degree from the Faculdade De Medicina Veterinaria de Lisboa, Universidade de Lisboa, Portugal. Also in 2013, Rui was awarded an M.S. degree from the University of Lisbon. A portion of his M.S. program was based on his Spring 2013 research internship at the Texas A&M AgriLife Research



Center in Overton with Drs. Ron Randel and Tom Welsh. The Aggie Connection was instrumental in placing Rui with Dr. Randel's Brahman cow herd. Specifically, on a trip to the University of Porto's vet school, Rui met Dr. Antonio Rocha, a theriogenology professor. Dr. Rocha earned his M.S. and Ph.D. degrees at TAMU in Physiology of Reproduction with Drs. Randel and David Forrest. It was Dr. Rocha's recommendation that brought Rui to Texas. After successful completion of his M.S. degree, Rui initiated pursuit of his doctoral program with Drs. Randel and Welsh in the Fall 2014.

Rui has been an enthusiastic and effective graduate teaching assistant in the lab components of the animal reproduction courses in the Department of Animal Science. Based on student and professor recommendations, He was selected as the recipient of the esteemed Dr. Ronnie L. Edwards Graduate Teaching Award in Animal Science in December 2015. With regard to his dissertation research, Rui was instrumental in preparation of a proposal to acquire a new 3D ultrasound to study follicular wave development in cattle (see Figure below). Rui has been involved in identification of early maturing female cattle and assessing the long range economic impact of early maturation and long term production of heifers that calve at an early age. Most recently Rui launched studies to determine the relationship of antral follicle number and reproductive maturation/productivity of tropically adapted cattle such as the Brahman breed. To date, Rui has presented 4 papers from his M.S. program and 5 papers from his Ph.D. program. He anticipates graduating in December 2017 and starting his independent careers as a rugby coach and theriogenologist.

AUSTIN HUNS
forward and
team captain
Rui d'Orey Branco

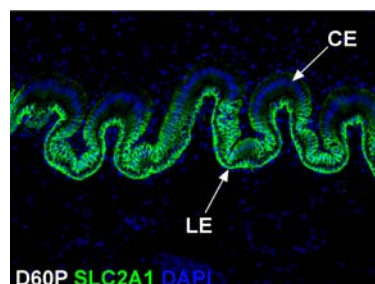


Above: Rui with his Dr. Ronnie Edwards Graduate Teaching Award. Left: A three-dimensional image of an ultrasonography examination of a Brahman cow. A, B, and C represent the three planes in a bi-dimensional image. The 3-D image is colored with the colors representing the follicles present

- Takeuchi H, Taoka R, Mmeje CO, Jinesh GG, Safe S, Kamat AM. CDODA-Me decreases specificity protein transcription factors and induces apoptosis in bladder cancer cells through induction of reactive oxygen species. *Urol Oncol*. 2016 Aug;34(8):337.e11-8.
- Taylor BD, Ness RB, Klebanoff MA, Zoh R, Bass D, Hougaard DM, Skogstrand K, Haggerty CL. First and second trimester immune biomarkers in preeclamptic and normotensive women. *Pregnancy Hypertens*. 2016 Oct;6(4):388-393.
- Taylor BD, Zheng X, Darville T, Zhong W, Konganti K, Abiodun-Ojo O, Ness RB, O'Connell CM, Haggerty CL. Whole-exome sequencing to identify novel biological pathways associated with infertility after pelvic inflammatory disease. *Sex Transm Dis*. 2017 Jan;44(1):35-41.
- Taylor BD, Tang G, Ness RB, Olsen J, Hougaard DM, Skogstrand K, Roberts JM, Haggerty CL. Mid-pregnancy circulating immune biomarkers in women with preeclampsia and normotensive controls. *Pregnancy Hypertens*. 2016 Jan;6(1):72-8.
- Turner CE, Walborn SR, Blanchard TL, Varner DD, Brinsko SP, LaCaze KA, Teague SR, Love CC. The effect of two levels of hemospemia on stallion fertility. *Theriogenology*. 2016; 86(6):1399-402.
- Varner DD. Strategies for processing semen from subfertile stallions for cooled transport. *Vet Clin North Am Equine Pract*. 2016 Dec;32(3):547-560.
- Varner DD. Approaches to breeding soundness examination and interpretation of results. *J Equine Vet Sci*, 2016.,43, S37-44
- Varner DD. Approaches to breeding soundness examination and interpretation of results. *J Equine Vet Sci*, 2016, 43, S37-44.
- Vogel J, Varner DD, Blanchard TL, Meschini M, Turner C, Teague SR, Brinsko SP, Love CC. The effects of urine concentration, and cushion centrifugation to remove urine, on the quality of cool-stored stallion sperm. *Theriogenology*. 2016 Sep 15;86(5):1294-8.
- Wang X, Li D, Wu G, Bazer FW. Functional Roles of Fructose: Cross-talk between O-linked glycosylation and phosphorylation of Akt-TSC2-MTOR cell signaling cascade in ovine trophectoderm cells. *Biol Reprod*. 2016 Sep 21. pii: biolreprod.116.142281.
- Wang X, Johnson GA, Burghardt RC, Wu G, Bazer FW. Uterine histotroph and conceptus development. II. Arginine and secreted phosphoprotein I cooperatively stimulate migration and adhesion of ovine trophectoderm cells via focal adhesion-MTORC2 mediated cytoskeleton reorganization. *Biol Reprod*. 2016 Sep;95(3):71.
- Washburn SE, Posey D, Stewart RH, Rogers KS. merging clinical cases, client communication, and physiology to enhance student engagement, learning, and skills. *J Vet Med Educ*. 2016 Summer;43(2):170-5.
- Watts AE, Dabareiner R, Marsh C, Carter GK, Cummings KJ. A randomized, controlled trial of the effects of resveratrol administration in performance horses with lameness localized to the distal tarsal joints. *J Am Vet Med Assoc*. 2016 Sep 15;249(6):650-9.
- Wu G. Dietary protein intake and human health. *Food Funct*. 2016 Mar;7(3):1251-65.
- Wu G, Cross HR, Gehring KB, Savell JW, Arnold AN, McNeill SH. Composition of free and peptide-bound amino acids in beef chuck, loin, and round cuts. *J Anim Sci*. 2016 Jun;94(6):2603-13.
- Wu M, Xiao H, Liu G, Chen S, Tan B, Ren W, Bazer FW, Wu G, Yin Y. Glutamine promotes intestinal SIgA secretion through intestinal microbiota and IL-13. *Mol Nutr Food Res*. 2016 Jul;60(7):1637-48.
- Wu Z, Hou Y, Hu S, Bazer FW, Meininger CJ, McNeal CJ, Wu G. Catabolism and safety of supplemental L-arginine in animals. *Amino Acids*. 2016 Jul;48(7):1541-52.
- Wu Z, Hu CA, Wu G, Zhaorigetu S, Chand H, Sun K, Ji Y, Wang B, Dai Z, Walton B, Miao Y, Hou Y. Intimacy and a deadly feud: the interplay of autophagy and apoptosis mediated by amino acids. *Amino Acids*. 2015 Oct;47(10):2089-99.
- Xiao D, Zeng L, Yao K, Kong X, Wu G, Yin Y. The glutamine-alpha-ketoglutarate (AKG) metabolism and its nutritional implications. *Amino Acids*. 2016 Sep;48(9):2067-80.
- Yi D, Hou Y, Mei H, Wang L, Hu CA, Wu G. β -Conglycinin enhances autophagy in porcine enterocytes. *Amino Acids*. 2016 Oct 19. [Epub ahead of print]
- Ying W, Tseng A, Chang RC, Wang H, Lin YL, Kanameni S, Brehm T, Morin A, Jones B, Splawn T, Criscitiello M, Golding MC, Bazer FW, Safe S, Zhou B. miR-150 regulates obesity-associated insulin resistance by controlling B cell functions. *Sci Rep*. 2016 Feb 1;6:20176.
- Zhou X, He L, Wan D, Yang H, Yao K, Wu G, Wu X, Yin Y. Methionine restriction on lipid metabolism and its possible mechanisms. *Amino Acids*. 2016 Jul;48(7):1533-40.
- Williams GL, Stanko RL. New synchronization protocols tailored for fixed-time AI in *Bos indicus*-influenced cattle. *Progressive Cattleman*, Feb. 2016, pp. 42-43
- Stanko RL, Williams GL. Options for fixed-time AI of Brahman-influenced cattle. *Brangus Journal*, March 2016, pp. 54-55.

BOOKS AND BOOK CHAPTERS

- Grady ST and Hinrichs K. Aplicación del diagnóstico genético preimplantacional en blastocistos equinos (Application of preimplantation genetic diagnosis in equine blastocysts; Review). *Spermova* 6(1):14-17 (2016).
- Grady ST and Hinrichs K. Factores que afectan la eficiencia de la producción de potros por inyección intracitoplasmática de espermatozoides (Factors affecting the efficiency of foal production by ICSI; Review). *Spermova* 6(1):18-21 (2016).
- Hinrichs K. How to use assisted reproductive techniques for managing the subfertile mare (Review). *Proceedings, Am. Assoc. Equine Pract.*, pp154-159 (2016).
- Hinrichs K. Embryo production and transfer in the horse (Review). *Proceedings, Joint meeting of the American Embryo Transfer Association – Canadian Embryo Transfer Association*, pp. 28-36 (2016).
- Hinrichs K. Update on equine embryo biopsy and vitrification (Review). *Clin. Theriogenology* 8:291-197 (2016).
- Hinrichs K. Equine oocyte recovery and ICSI in clinical practice: What can I expect? (Review). *Clin. Theriogenology* 8:285-290 (2016).
- N. H. Ing, K. O. Curley, C. Staub, T.H. Welsh Jr., L. Johnson. Anatomy and physiology of the male reproductive system and potential targets of toxicants. In: K.J. Johnson, C. McQueen (eds.), 3rd ed., Reference Module in Biomedical Sciences. Elsevier
- N.H. Ing Posttranscriptional regulation of steroid hormone receptors. In: Menon & Goldstrum (eds.) Posttranscriptional Mechanisms in Endocrine Regulation. Springer
- Rader K, Choi YH and Hinrichs K. ICSI, embryo culture, and transfer of in vitro-produced blastocysts. In: *Veterinary Clinics of North America: Equine Practice*, Coutinho da Silva M, ed., W.B. Saunders



Immunofluorescence staining of facilitated glucoser transporter member 1 (SLC2A1) at the uterine placental interface of a pig at Day 60 of pregnancy. Courtesy of Avery Kramer and Dr. Heewon Seo in the lab of Dr. Greg Johnson

49th SSR Annual Meeting, San Diego, CA

Trainee News

cont'd from p. 16



The 47th Annual Meeting of the Society for the Study of Reproduction was held 16 - 20 July 2016, San Diego, CA. The theme of the Meeting was "Systems Biology of Reproduction."

This year 5 trainees who submitted first-authored abstracts accepted for presentation at the Annual SSR meeting received travel funds to attend the SSR meeting. Trainees included Yang Gao, Yasser Lenin, Dr. Colleen Lambo, Dhafer Ibrahim, and Katharine Beason. Two trainees, Rui d'Orey Blanco, and Brittini Littlejohn, presented their work at the Joint Meeting of the American Dairy Science Association/American Society of Animal Science, and one trainee Brianna Myre, attended International Sea Turtle Symposium in Lima, Peru.

Dr. Fuller Bazer was an invited speaker at the Conceptus-Uterine Interactions: Critical Players in Pregnancy Success Focus Session. The title of his talk was, "Interferon Tau: Roles in Establishing and Maintaining Pregnancy."

Twelve IFRB faculty members and 15 current or former

trainees contributed to published abstracts at the meeting.

*Dr. Heewon Seo, postdoctoral fellow in the laboratory of Dr. Greg A. Johnson, was the recipient of a USDA-NIFA-AFRI Merit award and was also a finalist in the Trainee Research Award Competition. The title of his platform presentation was "Syncytial Trophoblast Fusion and Breaching of Uterine Luminal Epithelium in Sheep."

The IFRB gratefully acknowledges funding provided by the Texas A&M University Division of Research, Deans and Department Heads of the Colleges of Agriculture and Life Sciences, Medicine and Veterinary Medicine & Biomedical Sciences.



*Xiaoqiu "Churchill" Wang graduate student with Drs. Fuller W. Bazer and Guoyao Wu, received the following awards in 2016: - A. M. "Tony" Sorensen, Jr. Achievement Award, as Outstanding Graduate Student in Physiology of Reproduction. - The 2016 Texas A&M Association of Former Students University-level Distinguished Graduate Student Award; and - The 2016 Agri-King Outstanding Animal Science Graduate Student Award from American Society of Animal Science.

*Lacey Quail and Christian Cook with Drs. Ron Randel and Tom Welsh, Jr, were awarded COALS/AgriLife Merit and Excellence Fellowships.

*Anita Snell completed an M.S. in Aug. 2016 "Effect of monensin supplementation on follicular development of Brahman cows and the effect of sex and temperament on response of beef calves to Salmonella Newport Extract vaccine". Co-Chairs were Drs. Jason Banta, Ron Randel, and Tom Welsh. She was an AgriLife Extension Assistant and teaching assistant in Animal Science. She is now a Beef and Livestock Specialist for the University of Missouri Extension Service.

IFRB Committee Structure & Membership

Graduate Programs Committee

Carey Satterfield, Chair
Duncan MacKenzie
Greg Johnson
Martha Voglesang

Seminar Committee

Sakhila Banu, Chair
Michael Golding
Robert Burghardt
Gary Newton

Executive Committee

Charles Long, Chair
Fuller Bazer
Qinglei Li
Rajesh Miranda
Thomas H. Welsh, Jr.
Gary Williams
Rui Afonso d'Orey Branco, Trainee Rep

Nominating Committee

Joe Arosh, Chair
Marcel Amstalden
Michael Golding
Gary Williams
Shannon Washburn

Membership Committee

Kathrin Dunlap, Chair
Katrin Hinrichs
Nancy Ing
Farida Sohrabji
Thomas H. Welsh, Jr.



IFRB RESEARCH AND TRAINING MISSION:

Reproductive Biology is at the epicenter of the life sciences. Focal areas of research and graduate/postdoctoral training in the IFRB are interdisciplinary and cover both genders, encompass humans, domestic animals, laboratory animals and wildlife, and include: assisted reproductive techniques, biological clocks, cloning, conservation of endangered species, contraception, developmental biology, diseases of the reproductive tract, endocrinology, fertilization, fetal growth retardation, gametogenesis, gender-biased diseases and health issues, immunology, infertility, lactation, pregnancy and pregnancy-related disorders, premature labor, recovery of function, science and health policy, stem cell biology, systems biology and functional genomics, toxicology, and uterine biology. The outcomes of this research are impacting Texas, our nation and the world.

Mail Stop 2471

College Station, TX 77843-2471

Phone: 979-845-5929

Fax: 979-862-2662

Email: ifrb@tamu.edu

Comments,
Suggestions?

Contact
Newsletter Editors:

Bob Burghardt
Jay Ramadoss