# TEXAS A&M

## IFRB 2015

#### POINTS OF IN-TEREST:

- 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: 21st Annual R.O. Berry Lecture, 24 year old IFRB Repro Forum Seminar Series, 21st Texas Forum on Reproductive Sciences, Annual IFRB Retreat

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# Confronting and solving challenges to reproduction and health by conducting basic, clinical and translational research, and shaping science and health policy

#### 2015, ISSUE 2

# **New IFRB Faculty Spotlight**

FALL, 2015

Dr. Dana Gaddy, is a Professor in the Department of Veterinary Integrative Biosciences, and a new member of the IFRB. She shares musculoskeletal research laboratories in the VMR building with her collaborator, Dr. Larry J. Suva, the new Head of the Department of Veterinary Physiology and Pharmacology. Dr. Gaddy's federally-funded research program has focused primarily on the effects of reproductive hormones on skeletal regulation across age and menopause, as well as the agedependent influence of disuse and exercise on the musculoskeletal system.

Dr. Gaddy began her reproductive research career here at Texas A&M University as a MS student under the direction of Dr. Robert Burghardt. Following a PhD at Baylor College of Medicine in Dr. JoAnne Richards' lab, she did postdoctoral studies of pituitary gene expression with Dr. Wylie Vale at the Salk Institute for Biological Studies in La Jolla. Dr. Gaddy began her independent academic career at the University of Arkansas for Medical Sciences, where for the last 19 years she has focused on understanding the influences of nonestrogenic hormones in the



The Hypothalamic-Pituitary-Gonadal-Skeletal Axis



(HPG) axis on bone, in particular, the role of the gonadal peptides Inhibin and Activin. Using a variety of mouse in vivo and in vitro models as well as human clinical studies, Dr. Gaddy was the first to demonstrate that Inhibins and Activins have direct effects on bone forming osteoblasts and bone resorbing osteoclasts; cells that regulate the extent of bone turnover in all mammals. Importantly, the well-known changes in Inhibins that signal the entry into the menopause transition before the loss of estrogens are also correlated

hypothalamic pituitary gonadal

with and responsible for the early increases in bone turnover that drive bone loss during the menopause transition. Since both Inhibins and Activins regulate other hormones of the HPG axis, which also regulate the skeleton, Dr. Gaddy postulated that the HPG axis should be extended to include its combined effects on the skeleton, thus coining the HPG skeletal (HPGS) axis. Figure 1. Short or long term exposure of bone cells to reproductive hormones determines their effects (Figure 2, page 2). Several HPGS axis hormones as well as other endocrine factors access the skeleton via the circulation. Activin A, a circulating growth (continued on page 2)

Figure 1. Hypothalamic-Pituitary-Gonadal-Skeletal axis. Gonadotropin releasing hormone (GnRH) stimulates pituitary luteinizing hormone (LH) and follicle-stimulating hormone (FSH) secretion, which regulate ovarian function. FSH can stimulate osteoclast development, thereby increasing bone turnover. Oxytocin stimulates osteoblastogenesis/bone formation; prolactin affects bone cells in an age-dependent manner. Ovarian estrogen and inhibins negatively regulate LH and FSH, respectively, and modulate bone turnover and mass. Opposing effects of androgens have been observed, whereas progesterone has limited suppressive effects on bone mass accrual. Cyclic exposure of circulating inhibins and estrogen suppresses bone turnover, and osteoblast and osteoclast differentiation. Continuous inhibins or estrogen are anabolic and protect against gonadectomy-induced bone loss. (Nicks KM, FoowlerTW, Gaddy D. Curr Osteoporos Rep (2010) 8:60–67

## New IFRB Faculty, Dana Gaddy (cont'd from page 1)

factor that is also produced locally in bone and is liberated from the matrix during bone resorption, can act to regulate osteoclast cell motility and limit lifespan, thus providing an additional local level of control to limit bone resorption. In addition, Activin A also stimulates the recruitment and differentiation of bone forming osteoblasts. The extent of bone cell responses are critical to our understanding of the role of Inhibins and Activins. Planned future studies utilizing the extensive CVM imaging core in collaboration with Dr. Robert Burghardt should provide the first mechanistic insight into the intracellular processes that drive bone resorption and formation.

The hormonal changes that occur across the menopause transition are superimposed on the aging process. With the diminishing activity of the elderly human population, and the increases in nursing home patients, the impact of disuse on the aging skeleton may define patient quality of life. Dr. Gaddy's research has also been instrumental in describing the mechanisms that define the aging skeletons response to disuse and exercise. She was among the first to determine that disuse (hind limb unloading), primarily affects trabecular bone (spicules) in young adult rats, whereas aged rats lose cortical bone shaft via an increase in cortical porosity, resulting in diminished bone strength. In order to restore bone lost because of disuse, rats were reambulated after hind limb unloading and although young rats had a vigorous response to the exercise with increases in bone mass and strength, the aged rats were significantly inhibited in their response. These data provided the first important insights into the decreased sensitivity and responsiveness to exercise of the aged skeleton.

Although Dr Gaddy's lab research focus has utilized rodent models, the fundamental processes of bone remodeling in rodents do not accurately recapitulate the process in humans. Indeed, bone remodeling in larger animals (such as sheep and pig commonly utilized by IFRB members) is a far better model of living human bone and was a major attraction for joining the CVM at Texas A&M University. Given that the large number of reproductive studies currently being performed by other IFRB investigators are likely exerting yet-to-be-explored effects on the skeleton, the opportunity for collaboration is enormous and extremely attractive. Dr Gaddy is open to all such possibilities.



Figure 2. Inhibin and Activin Regulation of Bone Cell Activity. This pathology section of a "bone remodeling" unit highlights pink multinucleated bone resorbing osteoclasts (OCL) burrowing into and resorbing bone. The bone-forming osteoblast (OB) cells (stained blue) bind to newly resorbed bone surfaces and secrete new bone matrix (stained red). Activin A (blue A's) is liberated from the bone matrix by osteoclasts (OCL), and thus has immediate access to the mature bone resorbing OCL, where it blocks OCL migration and stimulates OCL death. This matrix-released Activin also inhibits the migration of OCL precursors from the bone marrow to the bone surface. Activin A also stimulates marrow OB precursor recruitment for OB differentiation and subsequent production of new bone. These local Activin effects are influenced by the effects of Inhibin and other HPGS axis hormones as well as by other endocrine factors coming from the circulation via blood vessels (red \*). Depending whether Inhibin exposure is cyclic or continuous, marrow cell responses can be either to suppress (-) bone turnover (cyclic) or to stimulate (+) bone formation (continuous).

#### SAVE THE DATE

The Twenty Second TFRS meeting will be held on April 21-22, 2016 at the MD Anderson Onstead Auditorium; Houston, Texas, 6550 Bertner, Houston, TX 77030; Social/Dinner Armadillo Palace

Thusday Plenary Speaker, Dr. W. Lee Kraus Director of Cecil H. and Ida Green Center for Reproductive Biology Sciences Professor and Vice Chair for Basic Sciences in the Dept. of OB/ GYN, UT Southwestern

Friday Plenary Speaker Dr. Janette Dufour Associate Professor Associate Dean for Research Department of Cell Biology and Biochemistry Texas Tech University Health Sciences Center Marie-Claude Hofmann, PhD

2016 TFRS Meeting Chairperson Chandra Yallampalli, PhD; 2016 TFRS Meeting Organizer

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# **IFRB Faculty Spotlight: Dr. Sakhila Banu**

Dr. Sakhila K. Banu, is an Assistant Professor in the Department of Veterinary Integrative Biosciences. Her research is focused on understanding the molecular mechanism of chromium (Cr)VI-induced developmental and reproductive toxicity, with the following research objectives: (i) determine the mechanism of prenatal exposure to CrVI on fetal ovarian development and premature ovarian failure (POF) in women; (ii) identify the mechanism of postnatal exposure to CrVI through mother's milk on pubertal onset, steroidogenesis, and pregnancy; (iii) investigate inter-generational and transgenerational effects of CrVI on female reproductive system development and function through epigenetic modulation; (iv) intervene CrVI-toxicity by antioxidants and nutrioxidants such as vitamin C, edaravone and resveratrol; and (v) identify effects of CrVI-toxicity on placental development.

Dr. Banu obtained her MSc (Zoology) degree from the American College, Madurai Kamaraj University, India. She started her research career in the Department of Endocrinology, University of Madras (Chennai), India, under the supervision and mentorship of Dr. M. Michael Aruldhas, PhD, a wellknown pioneer in the field of thyroid biology and male reproductive endocrinology/ toxicology. She completed her MPhil and PhD (Endocrinology) at the same department and migrated to Canada for her postdoctoral training. She joined Dr. Michel Fortier's laboratory, Laval University, Quebec City followed by a short-term postdoctoral training at the Faculté de médecine vétérinaire, University of Montreal

In May 2009, Dr. Banu joined the Department of Veterinary Integrative Biosciences, Texas A&M University as a Clinical Assistant Professor. She was promoted to a tenure track Assistant Professor position in January 2012. Her major research focus is to understand the reproductive and developmental toxicity of heavy metal endocrine disruptors. Heavy metals have been in anthropologic use from the ancient history to modern civilization. Their use has increased exponentially after the industrial revolution. Hexavalent chromium (CrVI), one of the more toxic heavy metals, is widely used in more than 50 industries such as chrome plating, welding, wood processing and tanneries. The U.S. is a leading producer of chromium compounds. We now face great challenges in protecting human health against multiple adverse effects of CrVI. In California, 30% of drinking water sources are contaminated with significant



levels of CrVI. According to the Environmental Working Group, 31 out of 36 major cities in the U.S have the drinking water contaminated with carcinogenic CrVI and 70 million Americans consume CrVI in drinking water that can cause oral and intestinal cancers according to recent experimental research by National Toxicological Program. The US Environmental Protection Agency (EPA) sets safe drinking water levels of Cr as 0.05 mg/L. The Cr problem is a global issue. Epidemiological studies have reported an increase in the risk of spontaneous abortion among women employed in Finnish metal industries. Occupational exposure to Cr during pregnancy increased the rate of abortion, decreased intrauterine growth of the fetuses, resulting in low birth weight of the new

born children. Pregnant women exposed to Cr experienced gynecological illnesses, abortion, postnatal hemorrhage and birth complications.

While the dangers of Cr in causing cancer are known, it's role in reproductive failures and infertility has not attained the notice of the public, in spite of Cr being recognized as a teratogen. Exploring fetal programming of the adult disease is rapidly growing in the current research. Exposure to endocrine disrupting

chemicals (EDCs) during fetal development and/or neonatal period are most vulnerable windows that critically impact adult health and diseases. Dr. Banu's laboratory is the leading group and the only team in the nation to study the reproductive toxicity of Cr on female reproduction and fetal development. A breakthrough finding from her lab was a report that prenatal exposure to CrVI during the ovarian organogenesis window in pregnant rats resulted in CrVI accumulation in the fetal ovary by traversing the placental barrier, increased germ cell apoptosis and induced premature ovarian failure (POF) in the FI offspring (Sivakumar et al., Develop Biol, 2014, 388:22). One of the mechanisms for CrVI-induced POF is through the disruption of a POF marker gene Xpnpep2 during fetal and postnatal ovarian development. Xpnpep2 encodes the protein X-propyl aminopeptidase, a collagen hydroxylase (Banu et al. Biol Reprod 2015, 92 (3):67). Neonatal and postnatal exposure to CrVI through lactation increased follicular atresia by inducing oxidative stress, activating p53 pathway and depleting endogenous antioxidant enzymes (Stanley et al. Free Radical Biology and Medicine 2013, 61:179). CrVI also altered the ratio of milk proteins. Banu lab has recently developed a whole fetal ovarian culture system which could potentially serve as a model system to study the effects of EDCs on the early development of the ovary (Stanley et al, Toxicol Appl Pharmacol, 2015, 289:58) (See Figure I, below).

#### (continued on page 8)











# Trainee Spotlight: Chelsie Steinhouser

**Chelsie Steinhauser** has recently completed the requirements for a Ph.D. degree in Biomedical Sciences within the Department of Veterinary Integrative Biosciences under the mentorship of **Dr. Greg Johnson**. She received a B.S. in Animal Science from Oregon State University and a M.S. in Biomedical Science from Colorado State University before coming to Texas A&M University as a Graduate Diversity Fellow.

Chelsie successfully defended her dissertation, "Hexose sugar transport and metabolism at the porcine uterine-placental

interface" on October 5, 2015. The pig has a fructogenic placenta, but there is no detectable fructose in the maternal blood, leading to questions of how and where fructose is synthesized and transported. Chelsie's dissertation work determined that the enzymes necessary for synthesizing fructose from glucose via the polyol pathway are localized to the uterine luminal epithelium (LE) during the peri-

implantation period of pregnancy when the embryo is freefloating and there is a substantial amount of fructose in the



uterine flushings. As pregnancy progresses and the placenta is established, the localization of the enzymes of the polyol pathway switches to the placental chorion, which allows the placenta to be self-sufficient in terms of fructose production for the remainder of pregnancy.

Chelsie's work also focused on the localization of transporters for both glucose and fructose at the uterine-placental interface. Because the pig has an epitheliochorial placenta, nutrients from the maternal blood must pass through multiple cell layers to reach the placental blood (*Figure* 1). Sugars require the presence of

membrane transporters for transport through these cells layers. Results of both in situ hybridization and immunohistochemistry indicated that multiple members of the solute carrier 2A family (SLC2A; also known as GLUT) localize to the cell layers of the uterine-placental interface in a time- and cell-specific manner. Additionally, quantitative PCR was used to determine that many of the SLC2A transporters studied in the uterus are upregulated by the steroid hormones progesterone (from the ovary) and estradiol (from the conceptus), indicating that cross-talk

> between the uterus, ovary, and conceptuses is necessary for the transport of sugars to the developing conceptus.

During her tenure at Texas A&M University, Chelsie presented her research to local, national, and international audiences including the Annual Meeting of the Society for the Study of Reproduction, where she received a USDA-NIFA Merit Award in 2015. She was awarded 3rd place in the platform presentation contest at the 2015 Texas Forum for Reproductive Sciences, was accepted to attend the 2014 Gordon Conference on Mammalian Reproduction, and was awarded a CVM Graduate Research Mini-Grant from the College of Veterinary Medicine at Texas A&M University. She also has 4 first-author manuscripts in preparation for submission. Beyond her work at Texas A&M University, Chelsie also served as a Trainee Governor for the International Embryo Transfer Society (2013-2014). Chelsie appreciates the advice and guidance from her graduate committee, Drs. Greg Johnson, Kayla Bayless, Fuller Bazer, and Robert Burghardt as well as funding from the Office of Graduate Studies and a Tier One Program Grant at Texas A&M University, and the USDA.

Figure 1. Diagram of glucose and fructose transport from the maternal to fetal vasculature. Epithelial placentation in the pig requires that nutrients pass through multiple cell layers to reach the placental blood.







Above: In situ hybridization showing distinct uterine and conceptus localization of mRNA for glucose transporters SLCA1 and SLCA2 in uterine luminal epithelium (LE) and conceptus trophectoderm (Tr) on Day 20 of pregnancy in pigs.



# **IFRB Seminar Series, Fall 2015**

The IFRB Seminar Series, Reproductive Biology Forum, has been held weekly during the Fall and Spring Semesters since 1990. The 2015 IFRB Seminar Series, coordinated by Dr. Michael Golding, continues to provide an excellent combination of seminars from internationally recognized reproductive biologists from outside and inside the university along with advanced IFRB trainees:

September 18, IFRB Business meeting, Dr. Chuck Long, Chair IFRB.

September 25, Dr. Rocio Melissa Rivera, Division of Animal Sciences, University of Missouri-Columbia, "ART, AGE and the Epigenome." Hosted by Dr. Michael Golding.

October 2, Dr. Bart Leemans, Department of

Reproduction, Obstetrics and Herd Health, Faculty of Veterinary Medicine, Ghent University, Ghent, Belgium, "Novel insights in capacitation of stallion spermatozoa: What is the role of the oviduct?" Hosted by **Dr**.

Katrin Hinrichs. October 9, Dr. Matthew Wheeler, Department of Animal Sci-

ences, University of Illinois, "Reproduction, Re-

generation and Engineering - Present Developments and

Prospects for the Future." Hosted by Dr.

#### Chuck Long.

October 16, Dr. Heewon Seo, Postdoctoral Fellow, Department of Veterinary Integrative Biosciences, "Syncytialization During Implantation in Sheep." Hosted by Dr. Greg Johnson.

#### October 23 Dr. Mellissa

Mann, Department of Obstetrics & Gynecology, and Biochemistry, Schulich School of Medicine and Dentistry, University of Western Ontario, "Developmental regulation of the Kcnqlotl imprinted domain." Hosted by Dr.

Michael Golding.

October 30, Xiaoqiu Churchill Wang, Physiology of Reproduction, Department of Animal Science. "Functional Roles of Fructose: Crosstalk between O-Linked Glycosylation and Phosphorylation of Akt-TSC2-MTOR Cell Signaling Cascade." Hosted by Dr. Fuller W. Bazer.

November 6, Kylee Veazey, Reproductive Sciences Laboratory, Veterinary Physiology and Pharmacology, "An Epigenetic basis to Fetal Alcohol Syndrome." Hosted by Dr. Michael Golding.

**November 13, Jacob Brown**, Physiology of Reproduction Section, Department of Animal Science, "Programmed Growth and Development in Response to Gestational Exposure to Sulfur Based Particulate Matter."

Alyssa Miller, Physiology of Reproduction Section, "Gestational Exposure to Sulfur Based Particulate Matter During Gesta-



tion Alters the Fetal and Postnatal Development of the Immune System." Hosted by **Dr. Carey Satterfield**.

November 20, 21 st Annual Dr. Raymond O. Berry Memorial Lecture (Surendra Sharma M.D., Ph.D) and 9th Annual IFRB Retreat, Navasota Civic Center, Navasota, TX. November 27, Thanksgiving Break



December 9, Dr. Soon Hong Cheong, Department of Clinical Sciences, Cornell University, "Resumption of Ovarian Cyclicity in the Postpartum Dairy Cow - Interplay Between General Health and Endocrine Function." Hosted by Dr. Ja-

mie Thompson. December II, Dr. Vasantha Padmanabhan, University of Michigan, Pediatrics-Endocrinology, "Programming PCOS Phenotype Organizational vs. Activational Contributions." Hosted by Dr. Annie Newell-Fugate.



# **Visiting International Scholars**

\*Dr. Pengfei Lin is a visiting scholar in Dr. Qinglei Li's lab. Dr. Lin is an associate professor at the Key Laboratory of Animal Biotechnology of the Ministry of Agriculture, College of Veterinary Medicine, Northwest A&F University, China. Dr. Lin is a wellestablished investigator and his previous work focuses on embryo implantation and follicular development and atresia.



He is particularly interested in unfolded protein response pathway in ovarian follicular development and ovulation. Dr. Lin has taught animal reproductive physiology to undergraduates and graduates. In Dr. Li's lab, he will investigate the function of TGF-beta signaling in female reproduction, particularly uterine development and cancer.

\*Carlos Pinzón, DVM, joined the laboratory of Dr. Charles Long as a M.S student. He recently graduated with honors from the Universidad Nacional de Colombia at Bogotá, Colombia, after completing his Doctor of Veterinary Medicine thesis work at the Reproductive Science Complex of Texas A&M University. His interests focus in the improvement of reproduction biotechnologies and the genetic engineering of livestock.



He has performed research in genetic engineering at the University of Cambridge, UK.

# **IFRB Trainee News**



\*Kylee J. Veazey, defended her dissertation entitled, "An Epigenetic Basis to Fetal Alcohol Spectrum Disorders." Kylee received her B.S. degree in Zoology from Texas A&M University in 2009. She joined **Dr. Mike Golding's** lab in 2010. Her dissertation research focused on understanding how epigenetic processes are involved in the development of childhood diseases, specifically the birth de-

fects associated with Fetal Alcohol Syndrome. Kylee maintained a 4.0 GPA and was the recipient of the 2012 CVM Outstanding Graduate Student award and the 2013 High Impact Publication award. This later award was given in recognition of her manuscript appearing in *Alcohol Clinical and Experimental Research* which is the highest-ranking publication in the field of fetal alcohol research, and both the MDLinx and Eureka science news services highlighted Kylee's study. Her dissertation research seven manuscripts. She is currently a postdoctoral fellow at the M.D. Anderson Cancer Center, Houston.

\*Xiaoqiu (Churchill) Wang, completed the requirements for the Ph.D. Physiology of Reproduction under the mentorship of Drs. Fuller W. Bazer and Guoyao Wu., and defended his dissertation, "Functional Roles of Histotroph (Arginine, Secreted Phosphoprotein I, and Fructose) in Trophectoderm Development



in Mammalian Conceptuses During the Peri-Implantation Period of Pregnancy." Churchill will begin postdoctoral studies with Dr. Franco DeMayo, deputy chief of the NIEHS Reproductive and Developmental Biology Laboratory. Some of Churchill's other accomplishments were highlighted in the Fall 2014 and Spring 2015 IFRB Newsletters.

\*Jonathan Chachere, completed the requirements for an M.S. in Physiology of Reproduction and was awarded his degree in August 2015. His thesis title was "Anti Mullerian Hormone Concentrations as a Predictor of Superovulation Response and Conception Rate in Beef Females ." His graduate advisory committee included: **Drs. David For**-

an rese om-

rest (Chair), Charles Looney (Co-Chair) and Jason Sawver.



\*Curtis Korthanke, completed the requirements for his M.S. degree in Physiology of Reproduction, working with **Dr. Gary Williams** in August, 2015. The title of his thesis was "Roles of estradiol and a putative neuropeptide FF receptor antagonist, RF9 in regulating gonadotropin secretion in the cyclic and seasonally anovulatory mare." He is currently in the DVM

program at Iowa State University, Ames, IA.



\*Daria Muller-Willis, received her Bachelors degree from the University of California Davis, and working with **Dr.** Michael Golding completed a Masters degree in Biomedical Sciences in August, 2015. Daria's project focused on thyroid hormone biology and epigenetic mechanisms of transcriptional control. Daria currently works as a clinical research

analyst at Proove Biosciences in Irvine California. **NEW TRAINEES AND AWARDS** 



\*Yudhishtar (Yudi) Bedi, was born in Chandigarh India and attended Manipal Institute of Technology (MIT) in India, where he received a B.S in Biotechnology. He received his M.S. in Biochemistry and Molecular Biology from the University of Southern California, where his dissertation research focused on peroxi-

some biogenesis disorders. Yudi worked as a project manager within the College of Pharmacy at Texas A&M Kingsville, before joining the Golding lab within the reproductive biology group at Texas A&M College Station. Yudi's current research focuses on environmental epigenetics.

\*Sarah Chronister did her undergraduate education at Hendrix College in Arkansas, where she received her Bachelors degree in Biochemistry and Molecular Biology. Sarah joined Dr. Mike Golding's lab within the reproductive biology group at Texas A&M College Station where her current project focus-



es on epigenetic mechanisms involved in the development of Fetal Alcohol Syndrome.



\* Dr. Katie Davis-Anderson attended Drury University in Spring-

attended Drury University in Springfield, MO and graduated with a B.A. in Biology and Chemistry in 2010. In August 2015 she completed her doctoral studies in Molecular Microbiology and Immunology at Saint Louis University, in St. Louis, MO. She married an Aggie, Steven Anderson, and

relocated to College Station this fall. She was excited to join **Dr. Jay Ramadoss'** lab as a Post-doctoral Research Associate and is enjoying these new research opportunities. **\*Brie Myre** recently joined **Dr. Duncan MacKenzie's** 

lab as a Ph.D. trainee. Brie completed her B.S. in Fisheries and Wildlife at the University of Nebraska

while interning in marine animal rehabilitation and exotic reptile captive breeding. Brie went on to complete her M.S. in Biology at Southeastern Louisiana University where she studied reproductive biology, including steroid hormones and vitellogenin production in free-ranging loggerhead sea turtles. Brie's interests include evolutionary ecophysiology and the interactions between the HPG and HPA axes in sea turtles and fish.



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# A Snapshot of IFRB Research, Fall 2015

- 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 the 6 month period June I to December 10, 2015:
- Arnold CE, Brinsko SP, Varner DD. Cervical wedge resection for treatment of pyometra secondary to transluminal cervical adhesions in six mares. | Am Vet Med Assoc. 2015 Jun 15;246(12):1354-1357.
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#### PAGE 8



Above: Journal cover highlighting a 2015 paper by Stanley, Banu, et al, titled, "A fetal whole ovarian culture model for the evaluation of CrVIinduced developmental toxicity during germ cell nest breakdown." in Toxicology and Applied Pharmacology 2015, 289:58.

Shown below is a confocal microscopy image from that study showing of one of the primary follicles that result from premature breakdown of the germ cell nests.

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

Because Cr leaches up to 160 ft deep into the ground through contamination of soil and ground water, and contaminates ground water, bioremediation of Cr from the soil, or preventing the global production or use of Cr may not be very practical or successful. Dr. Banu believes that the most important and feasible way to solve Cr problems on human health is to develop organbased intervention strategies to prevent Crinduced health problems. Interestingly, her research has identified and validated the efficacy of vitamin C (Banu et al. Toxicol Appl Pharmacol. 2008, 232:180), edaravone (Stanley et al. Biol Reprod, 2015, 91:12) and resveratrol as potential antioxidants to mitigate Cr toxicity. Recently Banu lab has extended their research on the effects of CrVI exposure on the placental development and function. CrVI exposure during gestational day 9.5 - 14.5 increased the expression of p53 and p53 upregulated modulator of apoptosis (PUMA) (Figure 2).

Dr. Banu has published 52 papers n peer reviewed scientific journals, 30 of which were published since joining Texas A&M University. Many of these publications have involved extensive participation of her trainees including current trainees (who include postdoctoral research associate Dr. Jone A Stanley, graduate research assistant, Kirthiram K Sivakumar and undergraduate student John Wu). She has also pub-



Dr. Banu's trainee colleagues include (from left to right) Postdoctoral Research Associate Dr. Jone A Stanley, Graduate Research Assistant, Kirthiram K Sivakumar and Undergraduate Student, John Wu

lished 2 book chapters. Her research has been funded by National Institute of Environmental Health Sciences (NIEHS), through an R03, R21 and R01 grants, and an Indo-US collaborative proposal award by the Indian Council of Medical Research, Federal government of India. Her recent collaborative research with an industry to characterize the formation of CrIII-DNA adduct has been funded by the Department of Defense. Her longterm research goal is to determine molecular and cellular mechanisms of heavy metal endocrine disruptors on male and female reproduction and fetal development, discover trans-generational effects of metal toxicity on female reproduction and neuroendocrine system through epigenetic pathways.

PUMA expression



p53 expression



Figure 2 (Gestational exposure to CrVI (25 ppm) through drinking water accumulated in the placenta and increased the expression of p53 (left) and PUMA, the p53 upregulated modulator of apoptosis (right) in both maternal and fetal compartments on gestational day 18 placenta.

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# 21st Annual Dr. Raymond O. Berry Memorial Lecture

The Twenty-first 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 November 20, 2015. Dr. Surendra Sharma, Professor of Pediatrics and Pathology, Brown University/Women and Infants' Hospital, and Deputy Director and Co-Director, National Institutes of Health Center of Biomedical Research Excellence in Perinatal Biology, Women and Infants Hospital, Brown University was selected by a vote of IFRB faculty to present the Lecture entitled, "Orchestrating the regulators: Gestational diabetes mellitus (GDM) disease risk and exhausted phenotype of regulatory T cells."

Dr. Surendra Sharma received his education from institutions of higher learning in India. He received the B.S. from M.M. College Modinagar, the M.B.B.S. (MD) from JN Medical College, and the Ph.D. from the Indian Institute of Technology, and then received postdoctoral training at Baylor College of Medicine in Houston, Texas. He also has an honorary Doctor of Medicine Degree from Linkoping University's Faculty of Health Sciences in Sweden.

Dr. Sharma is currently Professor of Pediatrics and Pathology in Brown University's Women and Infants' Hospital, and Deputy Director and Co-Director of the National Institutes of Health (NIH) Center of Biomedical Research Excellence in Perinatal Biology, Women and Infants Hospital, Brown University, Providence, Rhode Island. He has served on numerous study sections for the NIH, as well as North Atlantic Treaty Organization Grants for International Collaboration in Research, the American Cancer Society and the American Diabetes Association. He has also served as Associate Editor of the Journal of Immunology, Guest Editor and Member of the Editorial Board for the American Journal of Reproductive Immunology. Results of his research have been published in more than 120 refereed journal articles, invited reviews and chapters in books, and he has presented more than 126 invited lectures nationally and internationally.



Above: 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. Sharma's research is currently supported by a grant from the NIH to study cardiopulmonary development and immune programming of pregnancy and to help young investigators in their research

endeavors. Another grant from the National Institute for Environmental Health Sciences is for a Superfund Project Research to develop a statebased approach to complex environmental exposures with particular emphasis on genetic stress and toxicant-induced pregnancy disruption. Another grant from the NIH focuses on adverse pregnancy outcomes and anemia in pregnant women. Another grant from Brown University is for investigating protein misfolding and aggregation in preeclampsia. In addition to a very active research program, Dr. Sharma teaches courses in advanced immunology, immunopathology, pharmacology and pathobiology and he has a strong program in graduate education. He has mentored 14 visiting scientists and clinicians, 11 Ph.D. students, 11 Post-Doctoral Fellows and 7 Clinical Fellows, as well as three current graduate students. Dr. Sharma served as President of the American Society for Reproductive Immunology from 2010 to 2012. Dr. Sharma received the Blackwell Munksgaard Award in 2007 for outstanding contributions to Reproductive Immunology and the Distinguished Service Award from the American Society of Reproductive Immunology in 2014 for distinguished service to advance the goals and mission of that society.

**Right: Dr. Fuller Bazer** presented Dr. Surendra Sharma with a plaque commemorating his presentation as the Twenty-first Annual Dr. Raymond O. Berry Memorial Lecturer.



For his outstanding contributions, Texas A&M University recognizes the work of this distinguished scientist 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 contribute to animal agriculture and impacts the biomedical community. Dr. Berry's pioneering studies of genetic factors affecting reproduction con-

tributed 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 21 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.



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

-Fuller W. Bazer

### IFRB Trainee News, cont'd from page 10

### TEXAS A&M

Hanah M. Georges recently joined the laboratory of Dr.

**Chuck Long**. Hanah is from El Paso, TX where she worked with livestock which sparked her interests in livestock production. Upon completion of her undergraduate degree at Texas A&M University in Animal Science she joined the Reproductive Science Lab with research interests in improving ruminant nutrition through genetics. Past and current research experiences include work with porcine IRF-7 regulation and cell specificity of porcine cell promoters, both of which were done at the Reproductive Science Lab.



\*Raine Lunde is a Biomedical Science master's student in the



VTPP department. Raine works in the lab of **Dr. Jay Ramadoss** on mechanistic and diagnostic aspects of fetal alcohol spectrum disorders. Raine has co-authored publications in several journals including *Alcoholism: Clinical & Experimental Research & American Journal of Physiology.* Raine very much looks forward to advance in her graduate studies under the tutelage of Dr. Ramadoss as well as building upon her established research foundation on

the mechanistic perspectives of alcohol-related birth defects. After completing her undergraduate degree in BIMS, Raine worked as a research assistant for the late Dr. Timothy Cudd and later for Dr. Shannon Washburn for seven years investigating Fetal Alcohol Spectrum Disorders. During this time, she learned numerous experimental, surgical, & histological techniques.

Three new students joined the laboratory of **Dr. Gary Wil**liams:

\*Meaghan O'Neil, born in Silver Springs, MD. Graduated from



Merritt Island High School, Merritt Island, FL. Obtained B.S. degree in Animal Science (animal biology option) from the University of Florida in May, 2015. Started M.S. program in fall of 2015 in Physiology of Reproduction at Texas A&M University-College Station. Meaghan is the recipient of a College of Agriculture and Life Sciences Excellence Fellowship.

\*José Scarpa, born in Itanhandu, Brazil. Graduated from high school (Agrotechnical School of Inconfidentes) and obtained DVM degree in 2012 from Federal University of Lavras, Lavras, Minas Gerais, Brazil. Started M.S. degree program in fall 2015 in Physiology of Reproduction at Texas A&M.





**\*Youwen Zhang**, born in Xian, China. Graduate from high school (Shaanxi Light Industry School) and obtained B.S. and M.S. degrees in Animal Science form China Agricultural University, Beijing. He began his Ph.D. program in Physiology of Reproduction in fall 2015 at Texas A&M. He is the recipient of a Provost/College of Agriculture and Life Sciences Graduate Research Assistantship. \*Rui d'Orey Branco is from Portugal where he earned the DVM at Faculdade de Medicina Veterinária-UTL and a Master's degree. Currently he is working on his Ph.D. degree in Physiology of Reproduction in the Department of Animal Science under the mentorship of Drs. Ron Randel and Thomas H. Welsh, Jr. His research project focuses on the relationship between follicular patterns and the cow's overall reproductive productivity. As a hobby he has played rugby since he was 14-years-old and was



very fortunate to represent the national team of Portugal at international Level I for 10 years. He was recently named a recipient of the 2015 Dr. Ronnie L. Edwards Memorial Teaching Award in recognition of excellence as a teaching assistant in the Department of Animal Science. He was nominated for the award by **Dr. Carey Satterfield.** 



\*John Wu is a sophomore undergraduate Biomedical Sciences major working in the laboratory of **Dr. Sakhila Banu**. He is working in Dr. Banu's lab to further his knowledge in the medical field. After graduating from Texas A&M he plans to attend medical school.

\*William Skiles is a graduate student working in the laboratory of Dr. Michael Golding. He received his B.S. in Biomedical Sciences at Texas A&M in 2008. Will worked as a laboratory technician for four years at UT Southwestern in Dallas and joined the reproductive sciences group at Texas A&M University in 2013, where his project focuses on environmental epigenetics.



#### AWARDS

**\*Brittni Littlejohn**, doctoral student in Physiology of Reproduction, Department of Animal Science, working with **Drs. Ron Randel and Tom Welsh, Jr** placed 1st in the poster competition of the 2015 TAMU Stress Symposium, Oct 8-9, 2015. Her poster presentation, "Prenatal transportation stress alters temperament and serum cortisol concentrations in suckling Brahman calves." earned her a \$1,000 travel award and a plaque which was

presented by Dr. David Threadgill. Brittni also received a student travel scholarship to the 2015 ASAS Southern Section Meeting where she was also named the Graduate Student Representative for the upcoming year, In addition,



she was awarded third place in the graduate student competition for her abstract, Endogenous cortisol, luteinizing hormone, and testosterone secretion and GnRH-induced luteinizing hormone and testosterone secretion in prenatally stressed sexually mature Brahman bulls."

# 9th Annual IFRB Retreat, 2015

The 9th Annual IFRB Retreat was held on October 20, 2015 in conjunction with the 20th Annual Dr. Raymond O. Berry Memorial Lecture. Over 90 IRFB 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..



feld, "Adaptive

cental Nutrient Transport."

The organizers of the retreat were Drs. Gary Newton from Prairie View A&M and Greg Johnson, Veterinary Integrative Biosciences. Minisymposia were presented by **IFRB** Faculty:



Dr. Jay Ramadoss, "Maternal Perspectives in Fetal Alcohol Spectrum Disorders: Mechanisms and Diagno-

sis." Presenters at the "Data Blitz" section of

the Retreat program included: Dr. Shaye Lewis, "Understanding the Establishment of Male Caprine Fertility."

Trainee presentations included: Matt Snyder, "Suppression of ASH2L Alters DNA Methylation and Histone Patterns during Bovine Embryonic Development.'

Camille Duran, "Establishment of a Model to Study Uterine Microvascular Endothelial Cell Angiogenesis." Brittney Littlejohn, "Implications of Prenatal Stress on Temperament and Endocrine Function in Brahman Cattle."

Dr. Sicilia Grady, "Effect of Mesenchymal Stem Cells on Equine Ovarian Follicular Development and Gene Expression In Vivo."

Chelsie Steinhauser, "Fructose Synthesis and Transport at the Uterine-Placental Interface in Pigs"

There were also 35 posters presented by trainees during the retreat.

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 Griffith, 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.



Above: Retreat organizers, Drs. Gary Newton and Greg Johnson.



Top: Rogit More than 81 IFRB members participated at the 8th Annual IFRB Retreat held at the Navasota Civic Center, Navasota, TX.

Bottom: 35 poster presenters engaged in lively discussions with attendees. The IFRB thanks the College of Veterinary Medicine & Biomedical Sciences for providing easles and poster boards





Journal Cover highlighting a 2015 paper by Choi, Hinrichs, et al., titled 'Cell lineage allocation in equine blastocysts produced in vitro under varying glucose concentrations' in the journal Reproduction. Shown is an equine blastocyst produced by ICSI and in vitro culture, demonstrating presumptive trophectoderm (CDX2-positive, green), primitive endoderm (GATA6positive, red) and epiblast (Hoechst 33342-positive, CDX2- and GATA6negative, blue) cell lineages.

# **IRFB Faculty Activities, Awards, etc.**

#### NEW GRANTS:

\*Kayla Bayless, (PI), American Heart Association Southwest Affiliate Grant-in-Aid "Filamins stabilize a transmembrane complex to initiate angiogenesis" 01/10/16 - 12/31/7. Dr. Jeffrey Essner, Associate Professor at Iowa State University is a co-Investigator on the grant.

\*Dr. Sakhila Banu, (PI), NIH, IR01 ES025234-01A1, "Mechanism of prenatal chromium-VI exposure and germ cell apoptosis in the ovary," 09/01/2015 - 08/31/20, \$1.852,792

\*Drs. Fuller W. Bazer (PI), Guoyao Wu (Co-PI), Greg A. Johnson (Co-PI), USDA, AFRI 2015-06883, Arginine and secreted phosphoprotein I mediate cell signaling to enhance conceptus development and survival. 12/01/15-11/30/19; 460,000.

\***Dr. W. Les Dees**, NIH, 2R01NIH AA007216-24A1, "Neuroendocrine effects of alcohol on puberty," 09/01/2015 - 8/31/20, \$1,856,250

\*Drs. Greg A. Johnson (PI) Fuller W. Bazer (Co-I) USDA, AFRI 2015-06857; "Paracrine and autocrine signaling between the conceptus and uterus in pigs." 12/01/15-11/30/19; \$460,000.

\*Drs. Qinglei Li, (PI) and Robert Burghardt (Co-I), NIH, 1R03 HD08241601A1, "Characterization of a Novel Mouse Model with Enhanced TGF-beta Signaling in the Ovary," 07/01/2015 - 06/30/2017, \$141,515

\*Drs. Weston Porter and Monique Rijnkels, Co-Pls, NIH, R01 HD083952-01A1, "Regulation of differentiation gene expression," 09/1/15 – 08/31/20, \$1,850,000

**\*Dr. Jayanth Ramadoss,** NIH, R21AA023035, "A novel platform for maternal alcohol consumption screening," 9/2/15 - 9/1/17, \$421,169

\*Drs. Carey Satterfield (PI), Guoyao Wu (Co-I) and Fuller W. Bazer (Co-I), NIH 1R01HD080658-01A1 National Institutes of Health, "Understanding placental adaptation to maternal malnutrition." 9/1/15-6/30/20; \$1,510,299.

\***Dr. Stephen Safe**, NIH, IR21ES025839-01, "Cytosolic Ah Receptor: Mechanism of Action," 08/01/2015 -07/31/2017, \$391,954 \*Dr. Ashlee Watts, (PI), The University Court of the University of Glasgow, "Long-term assessment of tendonitis repair with miRNA in the horse," 5/1/15-4/30/16, \$289,861

#### **AWARDS & HONORS:**

**\*Dr. Kayla Bayless**, participated as a charter member of the Atherosclerosis, Inflammation, and Cardiovascular Sciences study section in Bethesda on Sept 28, 2015.

\* **Dr. Young Ho Choi** successfully sat the Board-Certifying examination for the American College of Theriogenologists in August, and is now a Diplomate of the college.

\*Dr. Annie Newell Fugate, was the third place award winner for her talk entitled "Virilizing concentrations of serum testosterone in females may affect insulin signaling in adipose tissue." at the American Veterinary Medical Association/American Veterinary Medical Foundation Young Investigator Award competition held during the Merial-NIH Veterinary Scholars Symposium at the University of California, Davis July 30-Aug 1, 2015.

\*Dr. Martha Voglesang was the recipient of the Equine Science Society's 2015 Distinguished Service in Equine Science Award, the most prestigious honor the organization bestows upon one of its members. The award recognizes her outstanding contributions to equine science including teaching, research and outreach. Vogelsang has been a member of the Equine Science Society since 1981 and has served the organization in several capacities including numerous committee memberships, secretary, vice president and program chair, and president.

\*Dr. Jay Ramadoss served as a Member or ad hoc Reviewer for the following study sections: Ad hoc reviewer, NIH AA-1 Biomedical Research Review Subcommittee, June, 2015; Member, NIH ZRGI EMNR D 55 R Translational Research in Pediatric and Obstetric Pharmacology, July, 2015; Ad hoc reviewer, NIH AA-1 Biomedical Research Review Subcommittee, Oct, 2015; Member, NIH ZAA1 GG Special Emphasis Panel; Nov, 2015.

**\*Dr. Ron Randel,** Senior Faculty Fellow and Regents Fellow, Texas AgriLife Research, Overton, was named as the Distinguished Graduate from Purdue University's Department of Animal Science, Oct, 2015.

\*Drs. Tom Welsh, Jr, and David Threadgill co-organized the "Evolution of Stress: From the Genome to Disease Symposium" sponsored by the Texas A&M Institute for Genome Sciences and Society (TIGSS)on October 8-9, 2015. The symposium explored current knowledge of stress research and how it can be used to improve human, animal and plant health. Nearly 500 people attended the keynote presentation by Dr. Robert M. Sapolsky of Stanford University.

#### **INTERNATIONAL ACTIVITIES:**

\*Dr. Fuller Bazer presented the following invited lectures: "Select nutrients and their effects on conceptus development in mammals," Changsha Conference on Nutrition, Changsha, China, July 13-15, 2015. "Pathways for synthesis of polyamines and their roles in conceptus development and pregnancy recognition signaling in sheep," 14th International Congress on Amino Acids, Peptides and Proteins, Vienna, Austria, Aug 3-7, 2015.

\*Dr. Katrin Hinrichs presented the following invited lectures: "In vitro equine embryo production and evaluation" Animal Sciences Centre, University of Porto, Vairaõ, Portugal, Nov 17, 2015; and "Oocyte transfer" and "Transvaginal ultrasound-guided follicle aspiration" Preconference workshop, A Day in the Life of an Equine Embryo, Association Européenne de Transfert Embryonnaire, Ghent, Belgium, Sept10, 2015.

\*Dr. Greg Johnson, was the Keynote speaker at the First International Symposium, Creation and Future Trends in Food and Agricultural Immunology, Sendai, Japan, December 11, 2015. The title of his lecture was "Inflammatory cytokines osteopontin and interferon gamma physically and functionally modify the uterus and placenta to support pregnancy." He also presented a lecture entitled, "Creation and Future Trends in Food and Agricultural Immunology Lecture, Immunology from a Uterine Biologists Perspective, Sendai, Japan.

(continued on page 14)



# Research Snapshot, cont'd from page 7



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Advances in Anatomy, Embryology and Cell Biology Rodney D. Geisert Fuller W. Bazer *Editors* 

#### Regulation of Implantation and Establishment of Pregnancy in Mammals

Tribute to 45 Year Anniversary of Roger V. Short's "Maternal Recognition of Pregnancy"

Springer

Above: Regulation of Implantation and Establishment of pregnancy in Mammals. Tribute to 45 Year Anniversary of Rober V. Short's "Maternal Recognition of Pregnancy" edited by Drs. Rodney D. Geisert and Fuller W. Bazer, Sept., 2015, Springer International Publishing AG, Cham, Switzerland.

Book includes chapters by current and former IFRB faculty and trainees including:

\*Bazer FW. "History of maternal recognition of pregnancy."

\*Lonergan P, Forde N. "The role of progesterone in maternal recognition of pregnancy in domestic ruminants."

\*Spencer TE, Hansen TR. "Implantation and establishment of pregnancy in ruminants."

\*Geisert RD, Johnson GA, Burghardt RC. "Implantation and establishment of pregnancy in the pig."

### Faculty Activities, cont'd from page 12

\*Dr. Guoyao Wu gave a one-week course on Principles of Animal Nutrition at Nanjing Agricultural University May 17-22, 2015. He presented two talks, "Glycine nutrition in young pigs" and "New advances in swine amino acid nutrition: lessons from research on intestinal metabolism" at the International Conference on Swine Gut Nutrition and Health, June 27-28, 2015.

\*Dr. Guoyao Wu presented two seminars, "Animal models in nutrition research" at South China Agricultural University and "Glutamine and fructose signaling in the pig placenta" at Guangdong Institute of Animal Science. July 4, 2015.

#### INVITED LECTURES

\*Dr. Fuller Bazer, Invited lecture at 35th annual meeting of the American Society for Reproductive Immunology, "The Many Faces of Interferon Tau at the Maternal-Conceptus Interface," Kingston, Ontario, Canada, June 2-5, 2015.

Billie A. Field Memorial Lecture entitled "The Many Faces of Interferon Tau during Pregnancy," University of Illinois, Chaimpaign-Urbana, Nov 9, 2015.

**\*Dr. Greg Johnson** presented two Plenary Lectures, one entitled, "Blastocyst-uterine interactions during the periods of implantation and placentation in sheep and pigs," Implantation and placentation session, at the Society for the Study of Reproduction (SSR) Annual Meeting, San Juan, Puerto, June 20, 2015. Another Plenary talk entitled, "OPN and its integrin receptors physically and functionally modify the uterus and placenta to support pregnancy, Organ Function and Pathology Session, The International Osteopontin and Other SIBLING Protein Conference, Chicago, II, Oct. 8-11, 2015.

**\*Dr. Qinglei Li**, was an Invited plenary speaker for 2015 Greenwald Symposium (October 22-23, 2015), Institute for Reproductive Health and Regenerative Medicine, University of Kansas Medical Center. The

title of his presentation was: "New insights into the function of TGF-beta signaling in the uterus." This annual symposium is held in memory of Dr. Gilbert S. Greenwald, a pioneer in reproductive biology research and founder of the reproductive biology research program at the University of Kansas Medical Center. <u>http://www.kumc.edu/</u> greenwald-symposium/speakers.html

**\*Dr Gary Williams** gave an invited lecture, "Nutritional Programming of Puberty in Heifers" at the Triennial Reproduction Symposium, American Society of Animal Science Annual meeting, Orlando, FL., July 12, 2015

\*Williams GL, Stanko RL, Amstalden M. Evolving concepts in the development and application of synchronization protocols for fixed-time AI in Bos indicus-influenced cattle: Bee Synch I and II. 59th Annual Texas A&M Beef Cattle Short course, August 5-7, 2015, College Station, TX

**\*Dr. Ron Randel,** Texas AgriLife Research Center in Overton, presented an invited lecture, "Temperament Is Linked with Stress Responsiveness and Is Controlled Genetically". at the 2015 TAMU Evolution of Stress: From the Genome to Disease Symposium, Oct 8-9, 2015.

#### **BOOK CHAPTERS**

\*Amstalden M, Williams GL. 2015, Neuroendocrine control of estrus and ovulation. In Bovine Reproduction, 2015; Edited by Hopper R.; Wiley-Blackwell, Hoboken, NJ USA pp 203-218.

\*Bazer FW, Johnson GA, Wu G. 2015. Amino acids and conceptus development during the peri-implantation period of pregnancy. In: Cell signaling during mammalian early embryo development. Leese H, Brison D, Eds., Springer, New York, pp 23-52.

\*Wang X, Wu G, Bazer FW. 2016. MTOR: The master regulator of conceptus development in response to uterine histotroph during pregnancy in ungulates. In: Novel insights into the role that the mechanistic target of rapamycin/ mammalian target of rapamycin. Maiese K, Ed., Elsevier, Cambridge, MA (in press).

# Katrin Hinrichs DVM, PHD, Regents Professor

**Dr. Katrin Hinrichs** was among seven Texas A&M University faculty members, including one at Texas A&M University at Galveston and two at the Texas A&M Health Science Center, who have been designated Regents Professors by The Texas A&M University System Board of Regents for 2014-2015.

"These individuals exemplify the commitment to excellence in research and service that sets A&M System employees apart," said John Sharp, Chancellor of the Texas A&M System. "Our System is made up of

outstanding people who do incredible work on behalf of the people and the state of Texas. I am grateful to all of them every day, and particularly to this group that really



represents the best of the best."

The selection process for the awards began with a call for nominations from the chancellor, after which an internal selection committee is formed within each institution or agency. Final nominations are put forth to the chief executive officer of each respective entity. They are then subject to a System-level review consisting of academic vice chancellors and past recipients of the awards. Finally, nominations are forwarded to the chancellor and the board for final approval.

To date, 201 Texas A&M System faculty members have been recognized with the Regents Professor Award. Congratulations Dr. Hinrichs!

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### **Research Snapshot**, cont'd from page 13



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# 48th SSR Annual Meeting, San Juan, Puerto Rico, June, 2015



The 48th Annual Meeting of the Society for the Study of **Reproduction was** held 18 - 22 June 2015, San Juan, Puerto Rico, USA . The theme of the Meeting was "Evolution of Sex." This year 4 trainees who submitted first authored abstracts accepted for presentation at the Annual SSR meeting received travel funds to attend the SSR meeting. Trainees

included Chelsie Burroughs Steinhauser, Yang Gao, Xiaoqiu (Churchill) Wang, and Jing (Jean) Xu. Two trainees, Rui d"Orel Blanco and Anita Snell presented their work at the Joint Meeting of the American Dairy Science Association/American Society of Animal Science.

**Dr. Greg Johnson** was an invited speaker at the Implantation and Placentation Session. The title of his talk was, "Blastocyst-uterine interactions during the periods of implantation and placentation in sheep and pigs," Fourteen IFRB faculty members and 10 trainees contributed to published abstracts at the meeting.

Two current and one past trainee were recipients of USDA-NIFA-AFRI Merit Awards. Awardees and the title

of their presentations included: Xiaoqiu Wang, "Functional Roles of Fructose: Induction of Proliferation and Adhesion of Ovine Trophectoderm Cells via O-Linked Glycosylation Mediated Phosphorylation of the Akt/PKB-TSC2-MTOR Cell Signaling." Coauthors were Kathrin A. Dunlap, Guoyao Wu, Fuller W. Bazer. Chelsie B. Steinhauser, "Pig Endometrium Expresses The

Polyol Pathway Enzymes Necessary To Convert Glucose To Fructose Prior To Implantation With A Shift To Chorion Expression Post-Implantation." Coauthors were McKinsey Landers, Louise Myatt, Robert C. Burghardt, Guoyao Wu, Jeffrey Vallet, Fuller W. Bazer, Greg A. Johnson. Bruna R. Alves, Nutritional Programming of Accelerated Puberty in Heifers: Alterations in DNA Methylation in the Arcuate Nucleus." Co-authors were

Rodolfo C. Cardoso, Ryan Doan, Gary L. Williams, Scott V. Dindot, Marcel Amstalden

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Contact Newsletter Editors: Jay Ramadoss Bob Burghardt 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.