

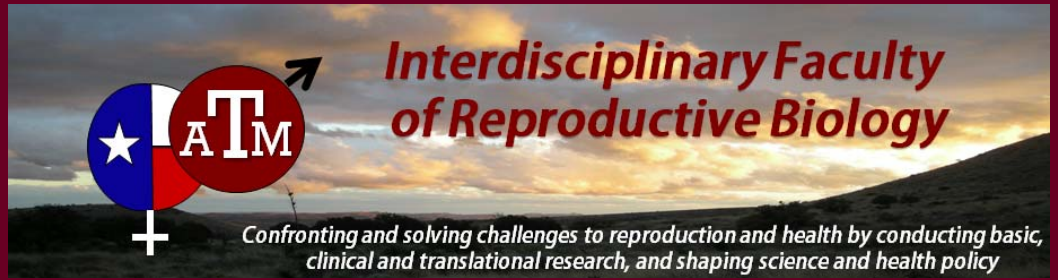
IFRB 2011

POINTS OF INTEREST:

- The IFRB was organized in 1992 and is one of the largest Reproductive Biology Programs in the US
- Membership includes 44 faculty from 5 departments, 3 colleges, 4 TAMUS components and 2 state agencies
- IFRB sponsored activities: Annual R.O. Berry Lecture, 19 year old IFRB Repro Forum Seminar Series, Texas Forum on Reproductive Sciences, Annual IFRB Retreat

INSIDE

New IFRB Faculty Spotlight	1
7 Billion People	1
IFRB Member Spotlight	2
19th Annual R.O. Berry Memorial Lecture	3
Trainee News	4
IFRB Seminar Series & Hot Papers	5
2011 SSR Meeting	6
IFRB Research Snapshot	7
Trainees	10



Interdisciplinary Faculty of Reproductive Biology

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

2011, ISSUE 2

FALL, 2011

New IFRB Faculty Spotlight



Neurodevelopmental damage as a result of prenatal alcohol exposure is a significant health problem and economic burden in the United States. Fetal Alcohol Spectrum Disorders (FASD) describes a continuum of permanent birth defects caused by maternal consumption of alcohol during pregnancy, which includes fetal alcohol syndrome (FAS), fetal alcohol effects (FAE), alcohol-related neurodevelopmental disorder (ARND), and alcohol-related birth defects (ARBD). The neurodevelopmental damage caused by prenatal alcohol exposure involves multiple mechanistic pathways.



Shannon E. Wilson, D.V.M., Ph.D. is the newest member of the IFRB. Dr. Wilson's research interests are focused on understanding the mechanisms of fetal alcohol spectrum disorders along with development of biomarkers and nutritional intervention strategies to prevent or ameliorate alcohol-induced neurodevelopmental damage. Current

work is supported by a NIH K08 (Mentored Clinical Scientist Research Career Development Award administered by the National Institute on Alcohol Abuse and Alcoholism) that provides support and "protected time" to individuals with a clinical doctoral degree for an intensive research career development experience in the field of biomedical and translational research.

Dr. Wilson is using a sheep model to investigate whether alcohol-induced alterations in maternal and fetal pH, oxidative stress and altered amino acid metabolism (which have been identified as potential contributing mechanisms to neurodevelopmental injury) can be corrected through maternal administration of glutamine, a key intermediate in several processes disrupted by alcohol. This has great potential as a nutritional intervention to prevent the damage caused by prenatal alcohol exposure. She is also using magnetic resonance imaging (MRI), fetal ultrasound

(New IFRB Faculty continued on page 2)

October 31, 2011 - 7 Billion People & Counting



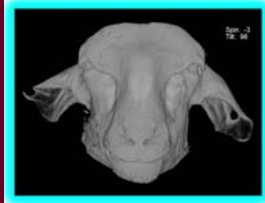
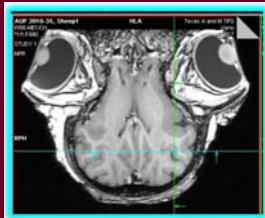
Eco News May 5, 2011

World Population of 7 Billion Persons: Contributions of Texas A&M University's Interdisciplinary Faculty of Reproductive Biology to Meeting the Anticipated Global Food Crisis and Reproductive Health Issues.

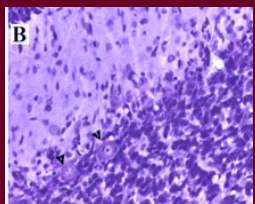
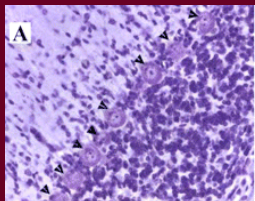
One of our most natural acts, like breathing, and walking upright, is to sit down at the table, pick up a fork and take a juicy bite of food, oblivious to the double helping of global ramifications of our plate. Our beef comes from Iowa, fed by Nebraska corn. Our grapes come from Chile, our bananas from Honduras, our olive oil from Sicily, our apple juice, not from Washington State, but from China. Modern society has relieved us of the burden of growing, harvesting, even preparing our daily bread, in exchange for the burden of simply paying for it.

(7,000,000,000 continued on page 9)

New IFRB Faculty (cont'd from page 1)



Drs. Cudd and Wilson are using noninvasive quantitative techniques such as ultrasound, MRI (top image) and CT scanning (bottom image) to develop biomarkers for prenatal exposure.



Sagittal sections of the fetal cerebellar vermis shows the decreased density of Purkinje cells (arrows) in ethanol (B) treated compared to saline control (A) ewes. (from Ramadoss et al., *Am J Physiol Regul Integr Comp Physiol* 295:R596-R603, 2008)

and CT scanning to develop biomarkers for prenatal alcohol exposure, since a crucial aspect of being able to provide any therapeutics for children affected by prenatal alcohol exposure involves successful early identification. These experiments exploit the unique advantages of the well-established sheep model, where the feto-maternal unit is intact throughout the entire equivalent of human fetal brain development. The sheep model also allows simultaneous fetal and maternal sampling, a

necessity in the investigation of neurodevelopmental injury and nutritional intervention strategies.

Dr. Wilson earned her D.V.M. (*magna cum laude*) from Texas A&M and entered the field of alcohol research after spending 12 years in private veterinary practice. She completed the Ph.D. degree in Biomedical Science in the laboratory of **Dr. Timothy Cudd**, Professor, Department of Veterinary Physiology & Pharmacology (VTPP)

in 2010. The same year, she was appointed to her current position as Clinical Assistant Professor and received notification of her K08 award. In her current faculty position, she teaches Biomedical Physiology, VTPP 423 to undergraduates and Physiology I and II, VTPP 910 and 912, in the professional program. Last year she was awarded the Phil Gramm Doctoral Fellowship for Excellence in Scholarly Research and Teaching.

IFRB Faculty Member Spotlight



Dr. Timothy A. Cudd, is a Professor, Department of Veterinary Physiology & Pharmacology, Charter Fellow of the Michael E. DeBakey Institute for Comparative Cardiovascular Sciences and Biomedical Devices and a long-standing member of the IFRB. Dr. Cudd is internationally known for his innovative research on Fetal Alcohol Spectrum Disorders (FASD).

Despite substantial efforts to educate women about drinking during pregnancy, the incidence of FASD has not declined making it important to obtain understanding of the mechanisms by which prenatal alcohol exposure causes neurodevelopmental damage in order to develop preventative and ameliorative strategies. Dr. Cudd has been well-funded throughout his academic career with grants from the American Heart Association, American Lung Association and the National Institutes of Health (NIH). He is currently in his 14th year of continuous funding from the National Institute on Alcohol Abuse and Alcoholism (NIAA) of the NIH for his R01 grant "Ovine Model System for Alcohol Related Birth Defects." Important mechanistic information has been derived from physiological assessment of fetal and maternal tissues that is being directed towards the development of strategies to prevent or ameliorate alco-



hol-induced neurodevelopmental damage. Some of the major discoveries resulting from this research that have involved substantial contributions from his trainees include observations that ethanol doses commonly achieved in human ethanol abusers results in: 1) changes in maternal and fetal heart rate, blood pressure, elevated blood carbon dioxide and acidification and maternal but not

fetal hypoxemia; 2) activation of hypothalamus-pituitary-adrenal axis in both the mother and fetus causing fetal ACTH and cortisol concentrations that may play a role in mediating alcohol-related birth defects; 3) decreased circulating thyroid hormone concentration in mother and fetus as well as fetal thyroid and thymus mass; 4) reduced fetal bone strength and length; 5) increased blood flow in (IFRB Faculty continued p. 12)

17th Annual Raymond O. Berry Memorial Lecture

The Seventeenth Annual Dr. Raymond O. Berry Memorial Lecture was held at the Veranda, Bryan, TX on October 21, 2011. The Annual Raymond O. Berry Lecture series is held in honor of Dr. Raymond O. Berry, a member of the faculty of the Agricultural and Mechanical College of Texas from 1931 to 1960 who contributed significantly to establishment of the discipline of Reproductive Immunology through his pioneering studies involving embryo transfer to evaluate genetic factors affecting reproduction.

Dr. Berry made many contributions to the fields of Reproductive Biology and Genetics. Pioneering work of Dr. Berry and his colleagues involved embryo transfer to study sheep/goat hybrids. Dr. Berry and colleagues made the first successful intra-species transfer of a goat embryo in 1932 and a successful intra-species sheep embryo transfer in 1933. Until that time, embryo transfer had been limited to rats and rabbits. Dr. Berry's research produced pregnancies from interspecies transfer of embryos between sheep and goats, but none was carried to term. Through these results, he was perhaps the first to demonstrate that the uterus is not an immuno-

logically privileged site. Pregnancy failure does result because the uterus of the goat rejects fetal-placental tissues of sheep and vice versa. Since that time scientists have determined that the trophoblast (placenta) associated with an embryo must be immunologically compatible with the mother. Therefore, a goat embryo will develop to term in a ewe if the early embryo is manipulated to insure that it has sheep trophoblast (placenta) and sheep/goat chimeras will develop successfully to term so long as the trophoblast (placenta) is immunologically compatible with the recipient female. 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.**



From left to right: Dr. Fuller W. Bazer, Regents Fellow, Distinguished Professor, O.D. Butler Chair, Department of Animal Science and Organizer of the Annual Raymond O. Berry Memorial Lecture; Dr. Margaret Petroff, the 17th Lecturer in the Series; Mrs. Dorothy McLemore, daughter of Dr. Berry; Dr. Joe McLemore, Obstetrician / Gynecologist in Houston, Texas and husband of Mrs. Dorothy McLemore; Dr. Duane C. Kraemer, Professor Emeritus Department of Veterinary Physiology and Pharmacology, and colleague of Dr. Berry when he was a member of the faculty of Texas A&M University.

logically privileged site. Pregnancy failure does result because the uterus of the goat rejects fetal-placental tissues of sheep and vice versa. Since that time scientists have determined that the trophoblast (placenta) associated with an embryo must be immunologically compatible with the mother. Therefore, a goat embryo will develop to term in a ewe if the early embryo is manipulated to insure that it has sheep trophoblast (placenta) and sheep/goat chimeras will develop successfully to term so long as the trophoblast (placenta) is immunologically compatible with the recipient female. 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.**

Over the past 17 years, Dr. Berry's daughters, Dorothy McLemore and Margaret Thompson and family members have attended the Lecture as guests. This year, Dorothy and her husband, Dr. Joe McLemore joined the IFRB for the Lecture, Social and Dinner that

followed. **Dr. Duane C. Kraemer**, Professor of Veterinary Physiology & Pharmacology and IFRB member worked with Dr. Berry during his early years as a graduate student. Dr. Kraemer led off the Lecture by providing an entertaining presentation that included memories of Dr. Berry.

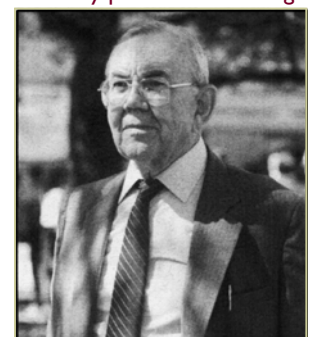
Dr. Margaret G. "Peggy" Petroff, was selected from a slate of potential speakers to present the Lecture by a vote of IFRB faculty in December, 2010. Dr. Petroff presented an excellent lecture entitled "The Maternal Immune Response to Paternally Inherited Antigens" which generated considerable discussion.

Dr. Petroff is an Associate Professor in the Department of Anatomy and Cell Biology, University of Kansas Health Science Center, Kansas City, Kansas and is well known for her research in reproductive immunology. She is a member of the Editorial Boards for *Journal of Reproductive Immunology*, *Reproduction*, *Biology of Reproduction* and *Journal of Visualizable Experiments*. Dr. Petroff has served on grant review panels for the Health Research Board of Ireland and Wellcome Trust and is currently a member of the NIH Study Section on Pregnancy and Neonatology.

Dr. Petroff has many publications of original data and scientific re-

views in top-tier journals. She is currently funded by three NIH research grants to study Maternal Tolerance to Fetal Alloantigens, Maternal Central Immune Tolerance to the Fetal-Placental Unit and HLA-G at the Maternal-Fetal Interface. In addition, she has a Kansas IDeA Network of Biomedical Research Excellence Partnership Grant for Translational Research to study Regulation of fetal antigens by oxygen in preeclampsia.

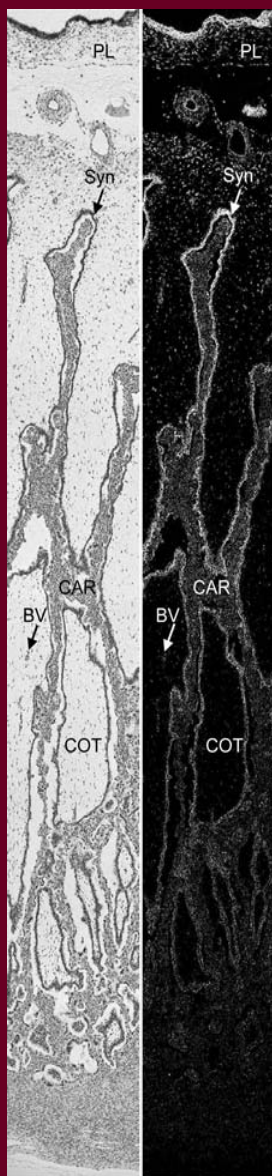
Support for the 17th Annual Lecture was provided by the Deans of the Colleges of Veterinary Medicine and Agriculture and Life Sciences as well as Department Heads in Animal Science, Veterinary Integrative Biosciences, Veterinary Physiology & Pharmacology and Large Animal Clinical Sciences.



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

-Fuller W. Bazer

Awards, etc.



In situ hybridization analysis for a disintegrin and metalloproteinase with thrombospondin like repeats 1 (ADAMTS1) mRNA within placentomes collected from unilaterally pregnant ewes on Day 80 of pregnancy. ADAMTS1 is a sphingosine-1-phosphate (SIP) and growth factor regulated gene prominent in placental tissues undergoing angiogenesis (from Dunlap et al., Biol Reprod 82:876-887, 2010).

NEW GRANTS:

***Joe Arosh**, NIH/NICHD R21 "Molecular Basis of Treating Endometriosis by Prostaglandin E2 Receptor Inhibitors." 09/30/2011 to 08/31/2013, \$402,875.

***Joe Arosh**, NIH/NICHD R21, "Prostaglandin E2 Signaling in Growth and Pains of Endometriosis." 10/01/2011 to 09/30/2013, \$402,000.

***Sakhila Banu**, NIH/NIEHS, R21, "Chromium VI-induced toxicity on female reproductive function." 08/16/2011 to 07/31/2013, \$402,800.

***Todd Bilby**, Elanco Animal Health, "Use of a Slow-Release Formulation of Recombinant Bovine Somatotropin to Enhance Fertility of Lactating Dairy Cattle," 2011. \$315,020, Sub-award to Texas Agrilife Research.

***Todd Bilby**, Evonik - Degussa Corp. Health, Effects of supplemental rumen protected Methionine on milk production, milk components, plasma hormones, and plasma metabolites in lactating dairy cattle. 2011. \$81,660.

***Gary Williams**, Pfizer Animal Health, "Impacts of Temperament and Presence of a Mature Corpus

Luteum on Efficacy of CIDR/PGR-based Synchronization of Bos indicus-influenced Beef Cows, 10/1/11-8/31/12, \$77,772.

***Guoyao Wu**, American Heart Association, Texas Affiliate, 8/1/2011 – 7/30/2012, "BH4 delivery to the vasculature via nanoparticles", \$70,000 (PI: Dr. C.J. Meininger).

***Guoyao Wu**, National Corn Growers Association, 8/1/2011 – 7/30/2012, "Use of clay to prevent aflatoxin toxicity in poultry and swine", \$45,000 (PI: Dr. Joe B. Dixon, Department of Soil and Crop Sciences).

(Awards, etc. continued on page 11)

IFRB Trainee News

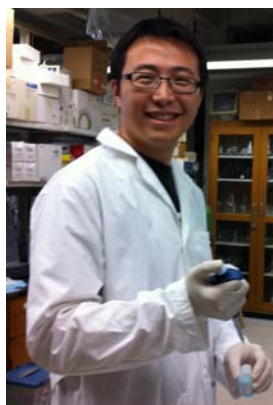
Dr. Bryan White, postdoctoral fellow in the laboratory of **Drs. Kayla Bayless and Greg Johnson** traveled to Geilo, Norway to attend the International Federation of Placenta Associations (IFPA) Meeting, Nov 12-17, 2011. He presented a poster-discussion "Manipulation of the SIP Signaling Pathway Decreases Placental and Fetal Development." His abstract was chosen by the IFPA Program Committee to receive a NIH Travel Award for Early Career Researchers. The Award provided travel support and accommodations at the meeting.



Ms. Fang Chen recently completed a one-year research fellowship funded by the China Scholarship Council in the laboratories of IFRB members, **Drs. Greg A. Johnson and Kayla J. Bayless**. In September, Fang returned to the China Agricultural University where she will complete her doctoral studies under the direction of Drs. Defa Li and Junjun Wang. While at Texas A&M University, Fang evaluated the expression and roles of the sphingosine-1-phosphate signaling pathway to support angiogenesis in the uteri and placentae of pigs.



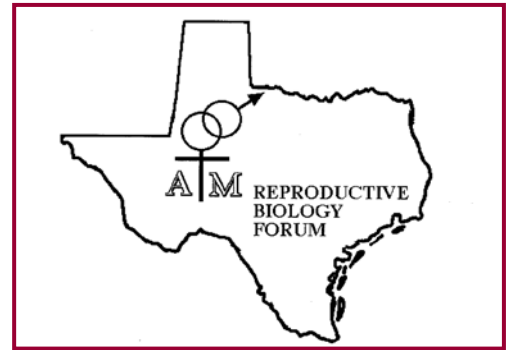
Dr. Jone Stanley completed his doctoral studies in Endocrinology at the University of Madras, India under the joint supervision of Drs. Michael M. Arulhas and **Sakhila Banu**. In October, 2011 he was appointed Postdoctoral Research Associate with Dr. Banu supported by an NIH grant awarded to Dr. Banu to study the effects of lactational exposure to hexavalent chromium (CrVI) on follicle development and female reproduction in F1 female rats, and mechanisms of toxicity intervention by vitamin C.



Dr. Kang Yao joined the laboratory of Dr. Guoyao Wu in October, 2011 as a Visiting Scholar. Dr. Yao is an Assistant Professor in the Institute of Subtropical Agriculture at the Chinese Academy of Sciences. His research focuses on the ability of functional amino acids to regulate metabolic pathways that impact health, growth, development and reproduction in pigs. Dr. Yao's 2008 paper (Yao et al., J Nutr 138:87-872) on arginine activation of the mTOR cell signaling pathway in piglet skeletal muscle is among the five most cited papers in the *Journal of Nutrition* over the past 2 years. His research is expected to provide new knowledge about the utilization of dietary protein and supplemental amino acids in animals.

(Trainee News continued on page 10)

IFRB Seminar Series, Fall 2011



The IFRB Seminar Series, Reproductive Biology Forum, has been held weekly during the Fall and Spring Semesters since 1990. The 2011 IFRB Seminar Series, coordinated by **Dr. Marcel Amstalden**, 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 2 **Dr. Robert Burghardt**, Chair IFRB, IFRB General Business Meeting

September 9 **Dr. Sakhila Banu**, VIBS, TAMU College Station. "Postnatal exposure to chromium-VI through mother's milk disrupts ovarian development and function of the F1 offspring." Hosted by **Dr. Marcel Amstalden**.

September 16 **James (Will) Frank**, VIBS, TAMU College Station. " α V (ITGAV) is necessary for the attachment of trophectoderm cells to SPP1 to mediate adhesion of the conceptus to the uterus during implantation in pigs." **Fang Chen**, VIBS, TAMU College Station. "SIP signal pathway is regulated during pregnancy in pig." Hosted by **Dr. Greg Johnson**

September 23 **Dr. William Heyman**, Geography, TAMU College Station. "Sex on the reef and voyeurism as ecotourism: the ecology and management of multi-species reef fish spawning aggregations." Hosted by **Dr. Marcel Amstalden**

September 30 **Dr. Warren G. Foster**, McMaster University, Hamilton, Ontario, Canada. "Mechanisms of cigarette smoke

induced sub-optimal ovarian follicle development and atresia." Hosted by **Dr. Joe Arosh**

October 7 **Dr. Nicholas Illsley**, New Jersey Medical School, Newark. "Regulation of fetal growth: intrauterine cues modulate the placental supply line." Hosted by **Dr. Fuller Bazer**

October 14 **Jennifer Thorson**, Animal Science, TAMU College Station. "Role of RF-Amide Related Peptide 3 (RFRP3) in mammalian reproduction an equine perspective" **Ligia Prezotto**, Animal Science, TAMU College Station. "Failure of an equine homologue of avian gonadotropin inhibiting hormone to alter secretion of luteinizing hormone in the mare." Hosted by **Dr. Marcel Amstalden**

October 21 **Reproductive Biology Retreat** (Coordinator: **Dr. Gary Newton**) Minisymposium I speakers: **Dr. Shannon Wilson**, "Nutritional Intervention and Biomarkers in an Ovine Model of FASD" and **Dr. Charles C. Love**, "The Application of Flow Cytometry in Theriogenology." Minisymposium II speakers: **Dr. Aline Rodrigues**, "Is the Early Developing Ovine Fetus Able to Respond to a Viral Infection?" **Dr. Shameena Bake**, "Maternal Ethanol Exposure Attenuates Blood Flow in Mouse Developing Fetus: Implication in Fetal Basis of Adult Diseases," and **Michael Peoples**, Production of transgenic livestock using a lentiviral virus encoding multiple short-hairpin RNAs targeting foot and mouth disease virus."

R.O. Berry Memorial Lecture, Coordinator: **Dr. Fuller Bazer**. **Dr. Margaret G. "Peggy" Petroff**, University of Kansas Medi-

cal Center, Kansas City. "The maternal immune response to paternally Inherited antigens."

October 28 **Bruna Alves**, Animal Science, TAMU College Station. "Nutritional programming of puberty: the Neuropeptide Y-GnRH circuitry." Hosted by **Dr. Marcel Amstalden**

November 4 **Dr. Peter Thomas**, University of Texas Marine Science Institute, Port Aransas. "Roles of membrane progesterone receptors (mPRs) and GPR30 in mediating rapid steroid actions: characteristics and controversies." Hosted by **Dr. Marcel Amstalden**

November 11 **Dr. Douglas Stocco**, Texas Tech University Health Sciences Center, Lubbock. "An Update on the Role of the Steroidogenic Acute Regulatory Protein (StAR) in the Regulation of Steroid Hormone Biosynthesis." Hosted by **Dr. Fuller Bazer**

November 18 **Dr. Qinglei Li**, VIBS, "TGF β signaling in the female reproductive tract." Hosted by **Dr. Marcel Amstalden**

November 25 No Forum – Thanksgiving

December 2 **Dr. John Davis**, University of Nebraska Medical Center. Title TBA. Hosted by **Dr. Kayla Bayless**



IFRB Hot Papers, Fall 2011

Golding MC, Magri LS, Zhang L, Lalone SA, Higgins MJ, Mann MR (2011) Depletion of Kcnq1ot1 non-coding RNA does not affect imprinting maintenance in stem cells. Development 138:3667-3678.

Jašarevic E, Sieli PT, Twellman EE, **Welsh TH Jr**, Schachtman TR, Roberts RM, Geary DC, Rosenfeld CS (2011) Disruption of adult expression of sexually selected traits by developmental exposure to bisphenol A. Proc Natl Acad Sci U S A. 108:11715-11720.

Kim K, Chadalapaka G, Lee SO, Yamada D, Sastre-Garau X, Defossez PA, Park YY, Lee JS, **Safe S** (2011) Identification of oncogenic microRNA-17-92/ZBTB4/specificity protein axis in breast cancer. Oncogene. 2011 Jul 18. [Epub ahead of print]

Lee J, Banu SK, Nithy TK, Stanley JA, Arosh J (2012) Early pregnancy induced expression of prostaglandin E2 receptors EP2 and EP4 in the ovine endometrium and regulated by

interferon tau through multiple cell signaling pathways. Mol Cell Endocrinol 211-223

Li Q, Agno JE, Edson MA, Nagaraja AK, Nagashima T, Matzuk MM (2011) Transforming growth factor β receptor type I is essential for female reproductive tract integrity and function. PLoS Genet 7(10):e1002320. doi:10.1371/journal.pgen.1002320



Trainee Spotlight



Xilong Li recently defended his doctoral dissertation entitled "Regulation of Porcine Conceptus Survival and Growth by L-Arginine and will be awarded the Ph.D. degree in December, 2011. (**Drs. Guoyao Wu and Fuller W. Bazer** served as co-chairs of his Graduate Advisory Committee. Prior to coming to TAMU, Xilong received a M.S. in Animal Science from China Agricultural University in Beijing.



His doctoral studies focused on investigating the impact of dietary supplementation with L-arginine with the goal of improving fetal survival and increase litter size in pigs. He discovered that dietary supplementation of 0.8% arginine between days 0 and 25 of

gestation reduces litter size, whereas dietary supplementation with 0.4% or 0.8% L-arginine between d 14 and 25 of gestation increased total volume of amniotic fluid, total amounts of arginine in allantoic and amniotic fluids, total amounts of fructose and most amino acids in amniotic fluid, placental growth, and the number of viable fetuses per litter by 2. These observations could have important implications in the commercial swine industry. Microarray analysis revealed that supplementation with 0.8% arginine between d 14 and 25 of gestation affected placental expression of 575 genes, with 146 genes being up-regulated and 429 genes being down-regulated. These differentially expressed genes play important roles in nutrient metabolism, as well as insulin, transforming growth factor beta, and notch signaling pathways.

During his doctoral studies, he published three first-authored papers and contributed to 20 other papers as a member of an interdisciplinary research team. Xilong will begin postdoctoral studies in the laboratory of Dr. Francesco DeMayo, Department of Cell Biology, Baylor College of Medicine in January, 2012.

44th Annual Meeting, Society for the Study of Reproduction

The 44th Annual Meeting of the Society for the Study of Reproduction was held in Portland, Oregon July 31-Aug 4. IFRB was well represented at the meeting with 27 reports involving 22 faculty members and 24 trainees.

Faculty participants from TAMU included **Drs. Marcel Amstalden, Joe Arosh, Sakhila Banu, Kayla J. Bayless, Fuller W. Bazer, Todd R. Bilby, Ralph G.S. Bruno, Robert C. Burghardt, Clay A. Cavender, Kathrin A. Dunlap, John Edwards, Greg A. Johnson, Charles Love, Gary R. Newton, Ronald Randel, M. Carey Satterfield, Jason E. Sawyer, Thomas Spencer, Luis O. Tedeschi, Thomas H. Welsh, Jr., Gary L. Williams, and Guoyao Wu.**

Trainee participants included **Carolyn C. Allen, Bruna R.C. Alves, Tyler G. Andrews, Erin Black, Rodolfo C. Cardoso, Grace Chang, Piotr L. Dorniak, Dr. David W. Erikson, Justyna Filant,**

James Frank, Ligia D. Presotto, Sorin M. Greff, JeHoon Lee, Megan A. Minton, Thami K. Nithy, Songrui Li, Xilong Li, Rebecca M. Simmons, Stephanie A. Standridge, Jone A. Stanley, Sam D. Stephen, Jennifer F. Thorson, and Dr. Bryan G. White.

Bruna Alves, D.V.M. and Piotr Dorniak, doctoral students in the laboratories of **Drs. Marcel Amstalden and Thomas Spencer**, respectively, received USDA National Institute of Food and Agriculture NRI Merit Fellow Awards which were presented at the meeting. Bruna's abstract title was "Accelerated Body Weight Gain During the Juvenile Period Reduces Neuropeptide Y Close Contacts with GnRH Neurons in Heifers." Piotr's abstract title was "Prostaglandins Regulate Endometrial Function in Sheep." **Will Frank**, a PhD student in the laboratory of **Dr. Greg A. Johnson** was selected as an SSR Trainee Research Award Finalist. The title of his abstract was "Integrin $\alpha 5$ is Necessary for Attachment of Trophoblast Cells to SPPI (Osteopontin) to Mediate Adhe-

sion of the Conceptus to the Uterus during Implantation in Pigs."

Travel awards for a number of IFRB trainees were provided by the IFRB with funding provided by the Texas A&M University Division of Research and Graduate Studies and Deans of the Colleges of Agriculture and Life Sciences and Veterinary Medicine & Biomedical Sciences. Trainees supported included **Bruna R.C. Alves, Peter Dorniak, Justyna Flyant, James Frank, Sorin M. Greff, JeHoon Lee, Xilong Li, Megan Minten, and Jennifer F. Thorson**

IFRB members are reminded to renew SSR membership which provides the following benefits:

- Free access to the Society's journal, *Biology of Reproduction (BOR)*;
- No page charges for publication in *BOR*;
- Discounts on annual meeting registration - for trainees, discount is greater than total membership cost;
- The Annual Meeting - an opportunity to interact with leading reproductive biologists and gain international recognition for your work;
- Representation and resources on policy issues, e.g., research funding, stem cell research, and animal use.

SSR 



Society for the Study of Reproduction

A Snapshot of IFRB Research Productivity

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 4 month period July 1 to October 31, 2011:

- Abdelbaqi K, Lack N, Guns ET, **Kotha L, Safe S**, Sanderson JT (2011) Antiandrogenic and growth inhibitory effects of ring-substituted analogs of 3,3'-diindolylmethane (ring-DIMs) in hormone-responsive LNCaP human prostate cancer cells. *Prostate*. 71:1401-1412.
- Bazer FW, Song G, Kim J, Erikson DW, Johnson GA, Burghardt RC, Gao H, Satterfield M, Spencer TE, Wu G** (2011) Mechanistic mammalian target of rapamycin (mTOR) cell signaling: Effects of select nutrients and secreted phosphoprotein 1 on development of mammalian conceptuses. *Mol Cell Endocrinol*. 2011 Sep 1. [Epub ahead of print]
- Bazer FW, Wu G, Johnson GA, Kim J, Song G** (2011) Uterine histotroph and conceptus development: select nutrients and secreted phosphoprotein 1 affect mTOR cell signaling in ewes. *Biol Reprod*. 2011 Aug 24. [Epub ahead of print]
- Bazer FW, Spencer TE**, Thatcher WW (2011) Growth and development of the ovine conceptus. *J Anim Sci*. 2011 Aug 12. [Epub ahead of print]
- Bazer FW** (2011) Contributions of an animal scientist to reproductive biology. *Biol Reprod* 85:228-242
- Bowers MC, Hargrove LA, Kelly KA, **Wu G**, Meininger CJ (2011) Tetrahydrobiopterin attenuates superoxide-induced reduction in nitric oxide. *Front. Biosci*. S3:1263-1272.
- Caldwell LC, Chase CC Jr, Riley DG, Coleman SW, Phillips WA, Spicer LJ, **Welsh TH Jr, Randel RD** (2011) The influence of tropical adaptation on plasma concentrations of IGF-I in purebred and crossbred beef cattle. *J Anim Sci*. 2011 Jul 1. [Epub ahead of print]
- Cerri RL, Chebel RC, Rivera F, Narciso CD, Oliveira RA, **Amstalden M**, Baez-Sandoval GM, Oliveira LJ, Thatcher WW, Santos JE (2011) Concentration of progesterone during the development of the ovulatory follicle: II. Ovarian and uterine responses. *J Dairy Sci* 94:3352-3365.
- Chintharlapalli S, Papineni S, Lei P, Pathi S, Safe S** (2011) Betulinic acid inhibits colon cancer cell and tumor growth and induces proteasome-dependent and -independent downregulation of specificity proteins (Sp) transcription factors. *BMC Cancer*. 2011 Aug 24;11:371.
- Chintharlapalli S, Papineni S**, Lee SO, **Lei P**, Jin UH, Sherman SI, Santarpia L, **Safe S** (2011) Inhibition of pituitary tumor-transforming gene-1 in thyroid cancer cells by drugs that decrease specificity proteins. *Mol Carcinog* 50:655-667.
- Choi YH, Varner DD, Love CC, Hartman DL, Hinrichs K** (2011) Production of live foals via intracytoplasmic injection of lyophilized sperm and sperm extract in the horse. *Reproduction* 142:529-538.
- Choi YH**, Velez IC, Riera FL, Roldán JE, Hartman DL, Bliss SB, **Blanchard TL**, Hayden SS, **Hinrichs K** (2011) Successful cryopreservation of expanded equine blastocysts. *Theriogenology* 76:143-152.
- Dunlap KA, Filant J, Hayashi K, Rucker EB 3rd, Song G**, Deng JM, Behringer RR, DeMayo FJ, Lydon J, Jeong JW, **Spencer TE** (2011) Postnatal deletion of wnt7a inhibits uterine gland morphogenesis and compromises adult fertility in mice. *Biol Reprod* 85:386-396.
- Dai ZL, **Li XL**, Xi PB, Zhang J, **Wu G**, Zhu WY (2011) Regulatory role for L-arginine in the utilization of amino acids by pig small-intestinal bacteria. .2011 Sep 18. [Epub ahead of print]
- Dorniak P, Bazer FW, Spencer TE** (2011) Prostaglandins regulate conceptus elongation and mediate effects of interferon tau on the ovine uterine endometrium. *Biol Reprod*. 2011; 84:1119-1127.
- Forde N, Carter F, **Spencer TE, Bazer FW**, Sandra O, Mansouri-Attia N, Okumu LA, McGettigan PA, Mehta JP, McBride R, O'Gaora P, Roche JF, Lonergan P (2011) Conceptus-induced changes in the endometrial transcriptome: how soon does the cow know she is pregnant? *Biol Reprod* 85:144-156.
- Foster ML, **Love CC, Varner DD, Brinsko SP, Hinrichs K**, Teague S, Lacaze K, **Blanchard TL** (2011) Comparison of methods for assessing integrity of equine sperm membranes. *Theriogenology* 76:334-341.
- Golding MC**, Magri LS, Zhang L, Lalone SA, Higgins MJ, Mann MR (2011) Depletion of Kcnq1ot1 non-coding RNA does not affect imprinting maintenance in stem cells. *Development* 138:3667-3678.
- Hou YQ, **Yao K**, Wang L, Ding BY, Fu DB, Liu YL, Zhu HL, Liu J, Li Y, Kang P, Yin Y, **Wu G** (2011) Effects of α -ketoglutarate on energy status in the intestinal mucosa of weaned piglets chronically challenged with lipopolysaccharide. *Br J Nutr* 106:357-363.
- Hulbert LE, Carroll JA, **Burdick NC, Randel RD**, Brown MS, Ballou MA. (2011) Innate immune responses of temperamental and calm cattle after transportation. *Vet Immunol Immunopathol*. 143:66-74.
- Jašarević E, Sieli PT, Twellman EE, **Welsh TH Jr**, Schachtman TR, Roberts RM, Geary DC, Rosenfeld CS (2011) Disruption of adult expression of sexually selected traits by developmental exposure to bisphenol A. *Proc Natl Acad Sci U S A*. 108:11715-11720.
- Kane CJ, Smith SM, **Miranda RC**, Kable J (2011) Proceedings of the 2010 annual meeting of the Fetal Alcohol Spectrum Disorders Study Group. *Alcohol*. 2011 Aug 31. [Epub ahead of print]
- Kang H, Kwak HI, Kaunas R, **Bayless KJ** (2011) Fluid shear stress and sphingosine 1-phosphate activate calpain to promote membrane type 1 matrix metalloproteinase (MT1-MMP) membrane translocation and endothelial invasion into three-dimensional collagen matrices. *J Biol Chem*. 2011 Oct 14. [Epub ahead of print]
- Kim J, Burghardt RC, Wu G, Johnson GA, Spencer TE, Bazer FW** (2011) Select nutrients in the ovine uterine lumen. IX. Differential effects of arginine, leucine, glutamine, and glucose on interferon tau, ornithine decarboxylase, and nitric oxide synthase in the ovine conceptus. *Biol Reprod*. 2011; 84:1139-1147.
- Kim K, Chadalapaka G**, Lee SO, Yamada D, Sastre-Garau X, Defossez PA, Park YY, Lee JS, **Safe S** (2011) Identification of oncogenic microRNA-17-92/ZBTB4/specificity protein axis in breast cancer. *Oncogene*. 2011 Jul 18. [Epub ahead of print]
- Lassala A, Bazer FW, Cudd TA, Datta S, Keisler DH, Satterfield MC, Spencer TE, Wu G** (2011) Parenteral administration of L-arginine enhances fetal survival and growth in sheep carrying multiple pregnancies. *J Nutr* 141:849-855.
- Lee J, Banu SK, Nithy TK, Stanley JA, Arosh J** (2011) Early pregnancy induced expression of prostaglandin E2 receptors EP2 and EP4 in the ovine endometrium and regulated by interferon tau through multiple cell signaling pathways. *Mol Cell Endocrinol*. 2011 Aug 31. [Epub ahead of print]
- Lehmann J, Ellenberger C, Hoffmann C, **Bazer FW**, Klug J, Allen WR, Sieme H, Schoon HA (2011) Morpho-functional studies regarding the fertility prognosis of mares suffering from equine endometrosis. *Theriogenology* 76:1326-36.

(Snapshot continued on page 8)

Snapshot (cont'd from page 7)

- Lents CA, **Randel RD**, Stelzleni AM, Caldwell LC, **Welsh TH Jr.** (2011) Function of the corpus luteum in beef heifers is affected by acute submaintenance feeding but is not correlated with residual feed intake. *J Anim Sci.* 2011 Sep 7. [Epub ahead of print]
- Li F, Yin YL, Tan BE, **Kong XF, Wu. G** (2011) Leucine nutrition in animals and humans: mTOR signaling and beyond. *Amino Acids* 41:1185-1193.
- Li Q**, Agno JE, Edson MA, Nagaraja AK, Nagashima T, Matzuk MM (2011) Transforming growth factor β receptor type 1 is essential for female reproductive tract integrity and function. *PLoS Genet.* 2011 Sep;7(10):e1002320. Epub 2011 Oct 20.
- Lim W, Kim JH, Ahn SE, Jeong W, **Kim J, Bazer FW**, Han JY, **Song G** (2011) Avian SERPINB11 gene: characteristics, tissue-specific expression, and regulation of expression by estrogen. *Biol Reprod.* 2011 Aug 17. [Epub ahead of print]
- Li Z, **Chadalapaka G**, Ramesh A, Khoshbouei H, Maguire M, **Safe S**, Rhoades RE, Clark R, Jules G, McCallister M, Aschner M, Hood DB (2011) PAH Particles Perturb Prenatal Processes and Phenotypes: Protection from Deficits in Object Discrimination Afforded by Dampening of Brain-Oxidoreductase Following in utero Exposure to Inhaled Benzo(a)pyrene. *Toxicol Sci.* 2011 Oct 19. [Epub ahead of print]
- Lim W, Ahn SE, Jeong W, Kim JH, **Kim J**, Lim CH, **Bazer FW**, Han JY, **Song G** (2011). Tissue specific expression and estrogen regulation of SERPINB3 in the chicken oviduct. *Gen Comp Endocrinol.* 2011 Oct 17. [Epub ahead of print]
- Lim W, Jeong W, Kim JH, Lee JY, **Kim J, Bazer FW**, Han JY, **Song G** (2011). Differential expression of alpha 2 macroglobulin in response to diethylstilbestrol and in ovarian carcinomas in chickens. *Reprod Biol Endocrinol.* 2011; 9:137.
- Mamo S, Mehta JP, McGettigan P, Fair T, **Spencer TE, Bazer FW**, Lonergan P (2011) RNA sequencing reveals novel gene clusters in bovine conceptuses associated with maternal recognition of pregnancy and implantation. *Biol Reprod.* 2011 Jul 27. [Epub ahead of print]
- Meininger CJ, **Wu G** (2011) Tetrahydrobiopterin: Important endothelial mediator independent of endothelial nitric oxide synthase. *Hypertension* 58:145-147.
- Miranda RC** (2011) Commentary: will analyzing the epigenome yield cohesive principles of ethanol teratology? *Alcohol Clin Exp Res.* 35:1201-123.
- Murray IV, Proza JF, **Sohrabji F**, Lawler JM (2011) Vascular and metabolic dysfunction in Alzheimer's disease: a review. *Exp Biol Med* 236:772-782.
- Nagashima T, Kim J, **Li Q**, Lydon JP, Demayo FJ, Lyons KM, Matzuk MM (2011) Connective tissue growth factor is required for normal follicle development and ovulation. *Mol Endocrinol.* 25:1740-1759.
- Pathi SS, Lei P, Sreevalsan S, Chadalapaka G, Jutooru I, Safe S** (2011) Pharmacologic doses of ascorbic Acid repress specificity protein (Sp) transcription factors and Sp-regulated genes in colon cancer cells. *Nutr Cancer* 63:1133-1142.
- Redmond JS**, Baez-Sandoval GM, Spell KM, **Spencer TE**, Lents CA, **Williams GL, Amstalden M** (2011) Developmental changes in hypothalamic Kiss I expression during activation of the pulsatile release of luteinizing hormone in maturing ewe lambs. *J Neuroendocrinol* 23:815-822.
- Romano JE, Thompson JA, Kraemer DC, Westhusin ME, Tomaszewski MA, Forrest DW** (2011) Effects of early pregnancy diagnosis by palpation per rectum on pregnancy loss in dairy cattle. *J Am Vet Med Assoc* 239:668-673.
- Salazar JL Jr, Teague SR, **Love CC, Brinsko SP, Blanchard TL, Varner DD** (2011) Effect of cryopreservation protocol on postthaw characteristics of stallion sperm. *Theriogenology.* 76:409-418.
- Shin JA, Shim JH, Choi ES, Leem DH, Kwon KH, Lee SO, **Safe S**, Cho NP, Cho SD (2011) Chemopreventive effects of synthetic C-substituted diindolylmethanes originating from cruciferous vegetables in human oral cancer cells. *Eur J Cancer Prev* 20:417-425.
- Spencer TE, Dunlap KA, Filant J** (2011) Comparative developmental biology of the uterus: Insights into mechanisms and developmental disruption. *Mol Cell Endocrinol.* 2011 Oct 8. [Epub ahead of print]
- Stanley JA, Lee J, Nithy TK, Arosh JA, Burghardt RC, Banu SK** (2011) Chromium-VI arrests cell cycle and decreases granulosa cell proliferation by down-regulating cyclin-dependent kinases (CDK) and cyclins and up-regulating CDK-inhibitors. *Reprod Toxicol* 32:112-123.
- Stewart BM, Block J, Morelli P, Navarette AE, **Amstalden M**, Bonilla L, Hansen PJ, **Bilby TR** (2011) Efficacy of embryo transfer in lactating dairy cows during summer using fresh or vitrified embryos produced in vitro with sex-sorted semen. *J Dairy Sci* 94:3437-3445.
- Strickland ER, Hook MA, Balaraman S, Huie JR, Grau JW, **Miranda RC** (2011) MicroRNA dysregulation following spinal cord contusion: implications for neural plasticity and repair. *Neuroscience* 186:146-160.
- Tjalkens RB, Carbone DL, **Wu G** (2011) Detection of nitric oxide formation in primary neural cells and tissues. *Methods Mol. Biol.* 758:267-277.
- Weems YS, Arreguin-Arevalo JA, Nett TM, Vann RC, Ford SP, Bridges PJ, **Welsh TH Jr**, Lewis AW, Neuendorff DA, **Randel RD**, Weems CW (2011) In vivo intra-luteal implants of prostaglandin (PG) E(1) or E(2) (PGE(1), PGE(2)) prevent luteolysis in cows. I. Luteal weight, circulating progesterone, mRNA for luteal luteinizing hormone (LH) receptor, and occupied and unoccupied luteal receptors for LH. *Prostaglandins Other Lipid Mediat* 95:35-44.
- Wang J, Wu Z, Li D, Li N, **Dindot S, Satterfield MC, Bazer FW, Wu G** (2011) Nutrition, Epigenetics, and Metabolic Syndrome. *Antioxid Redox Signal.* 2011 Nov 1. [Epub ahead of print]
- White BG**, MadPhee DJ (2011) Distention of the uterus induces HspB1 expression in rat uterine smooth muscle. *Am J Physiol Regul Integr Comp Physiol* 301:R1418-R1426.
- Wu G, Bazer FW, Johnson GA, Knabe DA, Burghardt RC, Spencer TE, Li XL, Wang JJ** (2011) Triennial Growth Symposium: important roles for L-glutamine in swine nutrition and production. *J Anim Sci* 89:2017-2030.
- Xi P, Jiang Z, Dai Z, **Li X**, Yao K, Zheng C, Lin Y, Wang J, **Wu G** (2011) Regulation of protein turnover by L-glutamine in porcine intestinal epithelial cells. *J Nutr Bioche.* 2011 Oct 13. [Epub ahead of print]
- Yao K, Yin Y, Li X, Xi P, Wang J, Lei J, Hou Y, **Wu G.** (2011) Alpha-ketoglutarate inhibits glutamine degradation and enhances protein synthesis in intestinal porcine epithelial cells. *Amino Acids.* 2011 Aug 23. [Epub ahead of print]
- Zhang S, **Kim K**, Jin UH, Pfent C, Cao H, Amendt B, Liu X, Wilson-Robles H, **Safe SH** (2011) Aryl Hydrocarbon Receptor (AHR) Agonists Induce MicroRNA-335 Expression and Inhibit Lung Metastasis of Estrogen Receptor Negative Breast Cancer Cells. *Mol Cancer Ther.* 2011 Oct 27. [Epub ahead of print]

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We have been consuming more food than farmers have been producing for most of the past decade. What will it take to grow more, especially when developing nations demand more and more animal protein from animal agriculture involving small ruminants?

A surging population from 7 billion today to 9 billion by 2045 is the major driver of increased food demand. To meet rising food demand, we need another revolution in plant and animal agriculture, and we need it in half the time. When will our citizens and our leaders recognize that agricultural production of an abundant, affordable and safe food supply is permissive to health, quality of life, political stability and economic stability? Why is there no support for a highly competitive National Institute for Food and Agriculture that will ensure that the United States of America maintains its leadership in modern agriculture so that we are never threatened by being dependent on any other country for our food supply?

Reproduction is essential for the health and well-being of human, domestic animal, companion animal, and wildlife populations. Society is at the boundary of a new frontier in issues affecting reproduction and health. *Our vision is to have **Reproductive Biologists** address challenges to reproduction and health by conducting basic, clinical and translational research and by shaping science and health policy using an integrated multidisciplinary research team approach.* This approach will allow the transfer of knowledge from the laboratory to the classroom, clinic (human and veterinary), field (animal agriculture and wildlife management), and community (information, policy, education). In this way, Texas A&M University will be a leader in identifying and addressing issues in reproduction and health facing society today, thus impacting Texas, our nation and the world.

Many of the most important challenges facing society today involve issues with reproduction and health including successful outcomes of pregnancy in food animal agriculture, contraception, and gender-biased diseases. Because reproduction and related health concerns touch some of the most vital and contentious issues affecting us as a nation, understanding these issues, informing the public about them, and designing and framing reproductive policies and procedures that are acceptable to the majority of the population is a challenge.

- **Successful Outcomes of Pregnancy:** The desired outcome of pregnancy is birth of a healthy child. In women, fertility peaks between the ages of 19 to 24, and declines after age 30. In the last several decades, there has been an increase in women postponing pregnancy until their 30s and even 40s, and this delay has increased the incidence of infertility and miscarriage. Of women attempting to conceive without using assisted reproductive techniques, 75% will get pregnant within one year at age 30, 66% will get pregnant within one year at age 35, but only 44% will get pregnant within one year at age 40. With women having children at older ages and having fewer children, the IFRB is addressing issues that favor successful outcomes of pregnancy in humans and animals.

- **Contraception:** Contraception is a regimen of one or more actions, devices, or medications followed in order to deliberately prevent or reduce the likelihood of pregnancy. This is a controversial issue, but one that must be addressed for humans and wildlife. Contraception has a huge social impact, as many of the most difficult problems in our state,

nation and world are attributed, at least in part, to overpopulation. This phenomenon contributes to poverty and hunger and their related issues of crime and disease as well as climate change. It is estimated that the current world human population of approximately 7 billion will increase to 7.5 billion by 2020. Although numerous contraceptives have been developed, it is clear that for many situations, the presently available contraceptives are not effective. In some cases the available contraceptives are not accepted for cultural reasons or may have potentially dangerous side effects, and in others, the methods of administration are not convenient.

Feral hogs cause \$50 million in damage to crops, livestock and wildlife in Texas where there is an estimated 3 to 4 million feral hogs. Feral horses (mustangs) represent a different challenge in that overpopulation of these horses results in ecological damage and loss of grazing land. Finding acceptable and effective contraceptives for use in wild animals is a necessary solution to this combined social and biological problem. Ironically, even endangered species can be overpopulated and deplete their habitat, and wildlife-associated problems such as feral predators and pests are exacerbated by overpopulation of animals. Clearly, more effective forms of contraception are needed to end the cycle of animal overpopulation and neglect.

- **Gender-biased Diseases:** Many diseases that do not directly affect the reproductive tract actually have a reproductive component. Depending on the disease, they are more common in one sex or the other, or may be affected by reproductive hormones during the menstrual cycle or during pregnancy. The reproductive component of the disease must be identified before these diseases can be addressed effectively, and research on the reproductive component can give insight into the causes of and possible treatments for the disease.

- **Social Science and Policy:** Social, political, economic and ethical issues have an enormous association with reproduction, reproductive research, and reproductive health. Understanding these issues, informing the public about them, and designing and framing reproductive policies and procedures that are acceptable to the majority of the population are essential. Not only do reproductive issues affect society, but consideration of ethical and societal issues also can help to shape research. Discovery research and technological advances in the reproductive sciences such as those possible in the IFRB initiatives will have policy, social and cultural implications and consequences, not only in Texas and our nation but with the rest of the world. Scientific innovations that change the way we approach reproduction, deal with related health applications and costs, and provide agricultural producers and individual patients (humans and companion animals) with reproductive health options that can only now be imagined will require great care in their design and implementation. Understanding the potential social problems engendered by research, and helping to design and frame procedures, processes and technologies that can unite much of our divergent populations is a key challenge in reproduction and health.



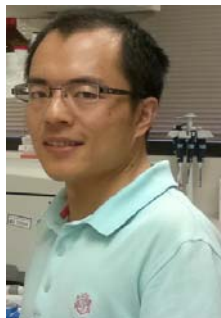
Trainee News (cont'd from page 4)



Mr. Yang Gao began his graduate research program under supervision of **Dr. Qinglei Li** in the Department of Veterinary Integrative Biosciences in September, 2011. He received his B. S. degree in Biological Sciences from the State Key Laboratory of Agrobiotechnology, China Agricultural University. His research focuses on the Smad signaling pathway in female reproductive system.



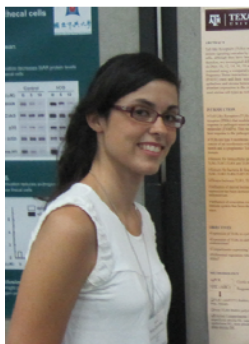
Dr. Chunjin Li joined the laboratory of Dr. Qinglei Li as a postdoctoral associate in October, 2011. He received his Ph.D. degree in Animal Reproduction from Jilin University in China in July, 2010. He then worked as a visiting student in Weizmann Institute of Science in Israel. His research focuses on identifying the role of TGF β signaling in regulation of myometrial function and dysfunction.



Ms. Rebecca Simmons completed her M.S. in Physiology of Reproduction with **Dr. Tom Spencer** and remained at Texas A&M as a Research Associate in **Dr. Carey Satterfield's** lab from 2009-2011. She recently completed her first semester in the Veterinary Medicine Program at St. George's University in Grenada (West Indies). She is following her dream to earn a D.V.M. and focus on the study of exotic animals. Shown here are Becky and her parents at the White Coat Ceremony at St. George's University this fall.



Irene Ruiz-Gonzalez, D.V.M. was a visiting scientist from Department of Animal Medicine and Surgery, Complutense University of Madrid, Spain where she is completing her Ph.D. program. She spent 10 weeks in the laboratories of **Drs. Fuller Bazer and Kahrin Dunlap** studying endometrial toll-like receptor expression in cyclic and early pregnant ewes. Those findings were presented as a poster for the 2011 SSR Meeting in Portland, Oregon.



Ms. Ashley Keith graduated from TAMU in 2010 with a B.S. in Animal Science. As an undergraduate, she participated in research programs with **Dr. Carey Satterfield** and **Dr. Ron Randel**. She is pursuing a M.S. in Physiology of Reproduction with Dr. Satterfield studying differences in placental nutrient signalling in undernourished ewes.



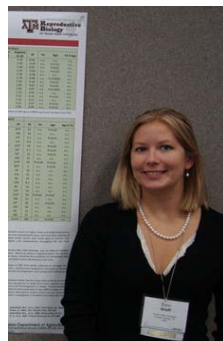
Mr. Michael Uzelac joined **Dr. Carey Satterfield's** lab in the spring of 2011. He is working towards a M.S. in Physiology of Reproduction, and is studying nutritional programming of renal function in fetal sheep. Michael is a 2010 graduate of the Animal Science Department of TAMU.



Thomas Miller and **Richard Jones** from **Dr. Duncan MacKenzie's** lab presented posters at the "NASCE 2011: The inaugural meeting of the North American Society for Comparative Endocrinology" in Michigan this past summer.



Ms. Sorin M. Greff completed her M.S. in Physiology of Reproduction with **Dr. Carey Satterfield** in August, 2011. Her thesis, "A Novel Role for Arginine in Enhancing Neonatal Thermogenesis" was selected for a platform presentation the Southern Association of Agricultural Scientists as well as a poster presentation at the 2011 Society for the Study of Reproduction Annual Meeting in Portland, Oregon.



Dr. Carmen Tekewe is a postdoctoral fellow in Biostatistics, Bioinformatics, Nutrition and Cancer under the guidance of Drs. Raymond Carroll, Alan Dabney and **Guoyao Wu**. Dr. Wu provides major data sets for development of statistical tools related to her research interests in proteomics, bioinformatics, longitudinal data analysis, survival analysis and measurement error models. She completed a Ph.D. in Biostatistics from the University of Buffalo in 2010.



In situ hybridization analysis of the lysosomal cysteine protease, CTSL1 expression in the luminal epithelium of progesterone treated gilts (from Song et al., Biol Reprod 82:854-864, 2010).



Awards, etc. (cont'd from page 4)

INTERNATIONAL ACTIVITIES:

***Fuller Bazer**, served as Chair of External Advisory Committee, Reproductive Biology Research Cluster, University College Dublin, Dublin, Ireland, June 12-15, 2011

- Invited lecture "The Roles of Select Nutrients in the Uterine Lumen of Sheep and Pigs," Japanese Society for Reproduction and Development, Morioka, Japan, September 12-16, 2011.

***Todd Bilby**, "Pharmaceutical, managerial and hormonal strategies to improve fertility in dairy cattle" 48th Annual Society of Brazilian Animal Sciences. Hanger - Belem, PA, Brazil, July 19-21, 2011.

- "Utilizing reproductive technologies and environmental modifications to improve fertility during summer in dairy cattle," Dia International del Ganadero Lechero de Delicias, Delicias, Mexico, September 6-8, 2011.

* **Katrin Hinrichs**, "Biotechnology in Equine Reproduction" IX National Congress, Società Italiana di Riproduzione Animale (Italian Society of Animal Reproduction), Valenzano, Italy, June 24, 2011.

***Greg Johnson**, "Osteopontin expressed at the Uterine-placental interface increases ion transport across the pig placenta," International Federation of Placenta Associations Meeting, Geilo, Norway, November 12-17, 2011.

* **Gary Williams**, "Reproductive seasonality in the mare: neuroendocrine basis and pharmacological control," 7th Interna-

tional Congress on Farm Animal Endocrinology, Bern, Switzerland, August 24-28, 2011.

- Chair of Graduate Advisory Committees of two students from Brazil, **Ligia Prezotto** and **Rodolfo Cardoso**

***Guoyao Wu**, "Functional Amino Acids in Nutrition and Health," 12th International Conference on Amino Acids, Beijing, China, August 3, 2011.

- "New Aspects of Amino Acid Biochemistry and Nutrition", Symposium on Recent Advances in Amino Acid Biochemistry and Nutrition, China Agricultural University, Beijing, China, August 6, 2011.

- "Efficiency of amino acid utilization by animals: biochemical and physiological bases", Inner Mongolia Academy of Agricultural Sciences, Hohhot, Inner Mongolia, China, August 8, 2011. (Supported by the Foreign Experts Bureau of China)

INVITED LECTURES:

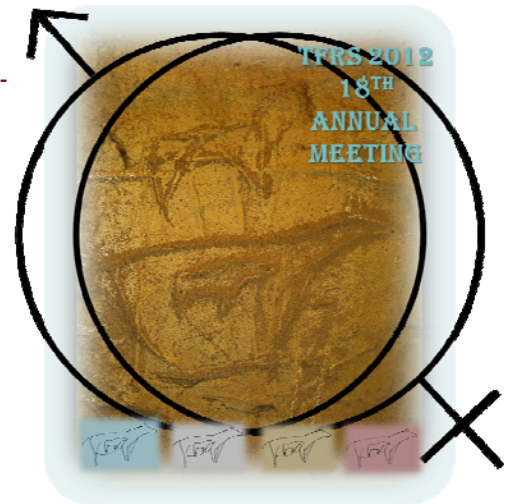
***Sakhila Banu**, "Lactational exposure to chromium causes follicular atresia in F1 offspring," University of Illinois, Urbana IL, September 28, 2011,

***Todd Bilby**, "Use of in vitro embryo transfer to improve summer fertility in dairy cows" American and Canadian Embryo Transfer Association Joint Convention. San Antonio, Texas, August 25-27, 2011.

***Guoyao Wu**, "Quantitative analysis of amino acid metabolism in the small intestine: Implications for nutrition and health" Cargill Conference on Biological Modeling in Animal Nutrition, Elk River, MN, August 23-25, 2011.

Save the Date

The 18th Annual meeting of the Texas Forum for Reproductive Sciences will be held April 12-13, 2012 at Rice University in Houston, TX.



-Logo for the 18th Annual meeting of the Texas Forum for Reproductive Sciences logo, prepared annually by Dr. Greg A. Johnson.

5th Annual IFRB Retreat, 2011

The 5th Annual IFRB Retreat was held on October 21, 2011 in conjunction with the 17th Annual Dr. Raymond O. Berry Memorial Lecture.

Over 70 IFRB faculty and trainees plus guests participated in the Retreat which was held at the Veranda in Bryan, TX. The organizer of the retreat was **Dr. Gary Newton**, Research Scientist, Cooperative Agricultural Research Center, Prairie View A&M University. Dr. Newton brought 8 trainees from Prairie View. Highlights of the Retreat were two mini-symposia with outstanding presentations by IFRB Faculty and Trainee members:



Minisymposium I speakers were **Dr. Shannon Wilson**, "Nutritional Intervention and Biomarkers in an Ovine Model of FASD" and **Dr. Charles C. Love**, "The Application of Flow Cytometry in Theriogenology."

Minisymposium II speakers were **Dr. Aline Rodrigues**, "Is the Early Developing Ovine Fetus Able to Respond to a Viral Infection?" **Dr. Shameena Bake**, "Maternal Ethanol Exposure Attenuates Blood Flow in Mouse Developing Fetus: Implication in Fetal Basis of Adult Diseases," and **Michael Peoples**, "Production of transgenic livestock using a lentiviral virus encoding multiple short-hairpin RNAs targeting foot and mouth disease virus." There were also more than 20 excellent poster presentations that generated good interactions and discussion among attendees. For the se-

cond year in a row, **Dr. Davey Griffin** and members of the Texas A&M Department of Animal Science Meats Judging team provided an excellent prime rib dinner.

Support for the 5th Annual IFRB Retreat and Dr. Raymond O. Berry Memorial Lecture was provided by **Dr. Eleanor M. Green**, Veterinary Medicine, **Dr. Dean, Alan Sams**, Executive Associate Dean, Agriculture and Life Sciences, TAMU and **Dr. Richard Griffin**, Acting Dean, College of Agriculture, Prairie View A&M University. In addition, Department Heads **Dr. H. Russell Cross**, Animal Sciences, **Dr. Glenn A. Laine**, Veterinary Physiology & Pharmacology, and **Dr. Evelyn-Tiffany-Castiglioni**, Veterinary Integrative Biosciences, provided financial support for the meeting.

IFRB Faculty Member Spotlight (cont'd from page 2)

brain regions that are vulnerable to elevated blood carbon dioxide and acidification including the cerebellum which leads to reduced numbers of Purkinje cells that results from ion channel inhibition; 6) altered levels of a number of amino acids in maternal plasma. The latter studies conducted in collaboration with **Dr. Guoyao Wu**, another IFRB member, have identified the acidosis-mediated reduction in circulating levels of glutamine and glutamine-related metabolites that could be responsible for neuronal deficits, altered fetal growth, development, and programming. Current studies are therefore evaluating whether the alcohol mediated decreases in pH and glutamine throughout the third trimester equivalent of human brain development results in increases in oxidative stress and if maternal glutamine supplementation is preventative. However, alcohol is known to act through more than one mechanism, therefore it is hypothesized that glutamine will substantially but not completely prevent brain injury. Results of these studies should help to develop a practical, combinatory, nutritional prevention strategies against neurodevelopmental damage.

For the past 5 years, Dr. Cudd has also been Principal Investigator on a U01 grant from the NIAA entitled "Translational Studies of FASD Using a Sheep Model." The latter grant is a multidisciplinary consortium that aims to accelerate specific areas of research related to the translation of new or improved capabilities in FASD clinical case recognition (through improved diagnosis, enhanced understanding of the domains of neurobehavioral impairment), interventions (behavior-based, nutritional and/or pharmacological) and prevention, by fostering collaboration and coordi-

nating basic, clinical, and translational research. Dr. Cudd's research group is contributing to this interdisciplinary effort through expanded studies using the sheep model to evaluate growth, facial morphometry, and effects on in vivo brain regional volumes using structural magnetic resonance imaging. They are also assessing neurobehavioral outcomes and neuroanatomical effects in the cerebellum, hippocampal formation, and brainstem serotonin system. These studies will inform four projects involving human studies on facial and brain imaging, neurobehavior and nutrition. The sheep model used in these studies provides a unique opportunity to bridge the basic and clinical arms of the consortium.

In addition to his outstanding research program, Dr. Cudd has had extensive instructional activities in the professional veterinary program. He has been course coordinator for VTPP 910 Physiology I and VTPP 912 Physiology II and has contributed to a number of undergraduate courses, Physiology for Bioengineers VTPP 334 and 335 and graduate courses including Cardiac and Integrative Cardiovascular Physiology MPHY 606/VTPP 656 and Vascular Physiology, VTPP 655. Dr. Cudd has also mentored 10 PhD students. In summary, Dr. Cudd has made enormous contributions to the IFRB through his contributions to our mechanistic understanding of FASD, his mentoring of IFRB trainees and his willingness to provide collaborative support to a number of investigators who utilize sheep as a model system.

IFRB Committee Structure & Membership

Graduate Programs Committee

Duncan MacKenzie, Chair
Joe Arosh
Carey Satterfield
Martha Voglesang

Seminar Committee

Marcel Amstalden, Chair
Robert Burghardt
Gary Newton
Carey Satterfield

Executive Committee

Robert Burghardt, Chair
Fuller Bazer, Vice-Chair
James Frank, Grad Student Rep
Greg Johnson, Past Chair
Marcel Amstalden
Katrin Hinrichs
Duncan MacKenzie
Guoyao Wu

Nominating Committee

Mike Golding, Chair
Marcel Amstalden
Clay Cavinder
Joe Arosh
Katrin Hinrichs

Membership Committee

Tom Welsh, Chair
Kathrin Dunlap
Farida Sohrabji



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.

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