Many fertility-related loci have been identified by genetic studies involving knockout, transgenic, and mutagenic studies in mice. The characterization of numerical imbalances in the genome and that result in disorders of sexual development and infertility has advanced our understanding of genes required for normal development and function of the reproductive tract. These regions can be caused by non-allelic homologous recombination between segments of low-copy repeats during meiosis. The resulting numerical imbalances or Copy Number Variations (CNVs) can result in changes in segments of the genome that disrupt genes or gene regulatory sequences. Subsequent changes in gene expression are observed in dosage sensitive genes. Based on current measures of heritability, often CNVs and associated phenotypes are caused by de novo imbalances. The “missing heritability” is debatable but predictions based on parental genotypes often have no predictive value for offspring genotypes.

Fertility characteristics traditionally show low heritability; it is a multi-factorial, complex trait influenced by multiple genes or gene interactions, endocrine, and environmental factors in isolation or in combination. This makes fertility-related selection practices impractical in livestock species. Furthermore, selection for various genotypes beneficial for production traits has resulted in simultaneous selection against advantageous fertility-related genotypes.

Dr. Shaye K. Lewis, recently hired as a Research Scientist in the Cooperative Agriculture Research and International Goat Research Centers at Prairie View A&M University, is the newest member of the Interdisciplinary Faculty of Reproductive Biology. Dr. Lewis received his Ph.D. in Physiology of Reproduction in the laboratories of Drs. Fuller Bazer and Thomas Spencer where he characterized the genomic structure and functional activities of the promoters of implantation related genes. Upon completion of his Ph.D., Dr. Lewis joined the laboratory of Dolores Lamb at Baylor College of Medicine as a NIDDK Fellow in the Department of Urology. His work at BCM focused on the identification of chromosomal structural variations resulting in copy number gains and losses in patients diagnosed with combined hypospadias and cryptorchidism. He showed that these subtle chromosome aberrations affect dosage sensitive genes (continued on page 2).

Reproductive Biology & One Health

The One Health concept is a worldwide strategy for expanding interdisciplinary collaborations and communications in all aspects of health care for humans, animals and the environment. Because reproductive biology is at the epicenter of the life sciences, the field has long played an important role in contributing to the goal of providing optimal health for people, animals and the environment.

Reproduction is essential for the health and well-being of human, livestock, companion animal, and wildlife populations. The vision of the IFRB 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), community (information, policy, education), and environment. In this way, Texas A&M University will be a...
in regions that are critical for genitourinary (GU) tract development. Sex-matched genomic DNA (gDNA) from men of proven fertility and normal development served as a control. Genomic hybridization from control gDNA was compared to gDNA from subjects with diseases of the GU tract including hypospadias and cryptorchidism by aCGH using 720K NimbleGen arrays (Roche). Subjects with diseases of the GU tract displayed distinct genomic regions affected by submicroscopic chromosome duplications or deletions not detected in normal pregnancy proven fertile controls, or in the Database of Genetic Variants (http://projects.tcag.ca/variation/). These submicroscopic imbalances affected genes involved in intracellular protein turnover in the ubiquitin proteasome system (UPS).

One such candidate region is 16p11.2 (Figure 1). The approximately 600 KB duplication affects 27 known genes and is associated with Autism Spectrum Disorder. None of the indicated patients presented with Autism Spectrum Disorder Syndrome but rather with congenital GU tract defects. A candidate gene in this region is potassium channel tetramerisation domain containing 13 (KCTD13), a substrate recognition domain in CUL3 RING-complex E3 ubiquitin ligase. Six additional CNV regions that affect E3 ubiquitin ligases in the UPS were observed in six unrelated subjects. The exact functions of genes involved in the UPS in the development and function of the testes are unknown. The UPS is critical for control of the hedgehog signaling pathways, which is important during development of the external genitalia and testes. Novel, candidate genes identified by aCGH may be required for normal GU tract, male external genitalia and testes development and function. To begin to understand the functions of these genes in the context of GU development, Dr. Lewis is cataloging expression of select genes involved in the UPS in the developing GU tract (Figure 2), developing transgenic mouse models, and conducting transient RNA interference experiments targeting the UPS of other fertility related genes.

The long-term objective of Dr. Lewis’ lab is the development of caprine breeding practices based on genotypic selection and the development of molecular markers for identification of advantageous fertility phenotypes during (continued on page 14)
Dr. Katrin Hinrichs, DVM, PhD, is a Professor in the Department of Veterinary Physiology and Pharmacology and holds the Pasty Link Chair in Mare Reproductive Studies at TAMU. The focus of her research is oocyte maturation, fertilization and early embryo development in the horse. Her laboratory has pioneered assisted reproductive techniques in the horse, achieving the birth of the first foal from an in vitro-produced embryo in North America and the birth of the first cloned horse foal in North America.

Dr. Hinrichs became interested in research while performing a Residency in Large Animal Reproduction at the University of Pennsylvania’s School of Veterinary Medicine where she also completed a PhD studying early embryonic development in the horse, focusing on the hormonal requirements for pregnancy in ovariec-tomized mares and the effects of the synchronous and asynchronous uterine environment on embryo development and uterine protein profiles. Dr. Hinrichs then took a faculty position at Tufts University, where she concentrated on the biology of the horse oocyte. Her group found that horse oocytes could mature after transfer to the follicles of live mares and produce embryos. She subsequently determined the relationships among follicle atresia, germinal vesicle chromatin configuration, and meiotic competence oocytes, which unlocked the door to establishing methods for effective oocyte in vitro maturation.

In 1998, Dr. Hinrichs joined the faculty at the TAMU College of Veterinary Medicine. Here, along with colleague Dr. Young-Ho Choi, she pioneered efficient methods for equine intracytoplasmic sperm injection (ICSI), and, subsequently, for in vitro culture of fertilized equine oocytes to the blastocyst stage. Dr. Hinrichs’ research has had an immense impact on understanding of factors affecting oocyte maturation, fertilization, and early embryo development in the horse, including the findings that: 1) equine embryos require high glucose levels for development to the blastocyst stage; thus establishing the first protocol for in vitro equine embryo culture that resulted in efficient blastocyst development; 2) that in vitro matured oocytes have normal fertilization rates in vitro, indicating that the failure of equine IVF is not due to zona hardening; 3) that oocyte origin (degree of follicle atresia), duration of ovary transport and duration of oocyte maturation interact to affect developmental competence of horse oocytes; 4) that the equine embryo fails to differentiate (regulate expression of POU5F1) appropriately in vitro, but that this is corrected after transfer (to the uterus; 5) that injection of murine PLCζ cRNA induces Ca2+ oscillations, activation, and embryo development in equine oocytes; 6) that the equine embryonic capsule may be breached and expanded blastocysts biopsied without a detrimental effect on viability; and 7) that equine expanded blastocysts may be collapsed for effective vitrification.

Once the ICSI procedure was repeatably efficient, her group started performing research aimed at translating the procedure for use in the clinics. Her laboratory determined that equine sperm could undergo two freeze/thaw cycles without effect on capability to produce embryos after ICSI, identified methods for holding of oocytes to schedule maturation and subsequent manipulation, and evaluated methods for transport of ovaries. To this end, they also evaluated methods for collection of oocytes from live mares, determining that transvaginal aspiration of immature follicles was repeatable and produced adequate numbers of oocytes for potential embryo production without being detrimental to mare health. Based on these research results, Dr. Hinrichs’ laboratory started a clinical program in equine ICSI at Texas A&M University, offering embryo production both post-mortem, from valuable mares that suffer untimely death, and, in conjunction with the Section of Theriogenology in the Large Animal Veterinary Teaching Hospital, after oocyte collection from live mares. In the 2013 breeding season, the equine ICSI program at TAMU performed 144 aspirations on client mares, collecting 1,100 oocytes and producing 162 blastocysts that were transferred to recipient mares or vitrified for later transfer.

Concurrently, Dr. Hinrichs’ group has continued to explore standard IVF in the horse, focusing on reasons for its failure in relation to sperm capacitation. They collaborated with scientists at Cornell University, to determine that after induction of tyrosine phosphorylation (PY) in sperm, treatment to stimulate hyperactivated motility increased rates of equine IVF. They also reached the novel finding that PY of equine sperm was modulated by medium pH independently of presence of calcium, bicarbonate or albumin in the capacitation medium, and that, at low pH, both calcium and albumin inhibit PY. Additionally, in contrast to findings in other species, albumin did not remove cholesterol from the equine sperm plasma.

In vitro-produced (top) and in vivo-produced (bottom) equine embryos stained to show trophoblast (red) and inner cell network (blue).
Dr. Wu Organizes ICAAP, Publishes New Book

The 13th International Congress on Amino Acids, Peptides and Proteins (ICAAP), a traditionally European scientific meeting, was held for the first time in North America on Oct. 5-7, 2013 in Galveston, Texas.

Scientific topics discussed include biochemistry, biomedicine, chemistry, food science, immunology, nutrition, physiology, pharmacology, reproduction, and toxicology of amino acids, peptides, and proteins, as well as genetics and bioinformatics related to their synthesis, catabolism, and utilization in humans and other animal species. Submitted abstracts spanned a wide range of research involving animals (e.g., fish, mice, rats, pigs and sheep), humans, microorganisms, plants, and cell culture models.

Dr. Guoyao Wu, University Distinguished Professor in the Department of Animal Science, served as the current president of ICAAP and was instrumental in bringing the conference and more than 200 international scientists to the United States. “More than 135 papers from 32 countries and regions were presented at the 13th ICAPP. It was our goal that the forum provide an invaluable opportunity for both scientists and graduate students to learn about exciting research conducted outside of their own laboratories, foster new research collaborations, develop long-lasting friendships, and freely exchange scientific ideas in a relaxing setting,” Wu said. Dr. Fuller Bazer, University Distinguished Professor, delivered one of the keynote addresses entitled “Amino acids, peptides and proteins as histotroph in embryo development: discoveries and important roles in reproductive health.” Additionally, 12 faculty including Drs. Kevin Burgess, Raymond Carroll, Greg Johnson, Cynthia Meininger, Carey Satterfield, Stephen Smith, Carmen Tekwe, and Shannon Washburn and IFRB graduate students from the multiple academic units of Texas A&M University presented their current research.

Dr. Wu’s new book, Amino Acids Biochemistry and Nutrition, was published in April. The book spans a broad range of fields including biochemistry, metabolism, physiology, immunology, reproduction, pathology, and cell biology. Comprehensive coverage of technical advancements, from analysis of amino acids by high-performance liquid chromatography and mass spectrometry to molecular cloning of transporters for amino acids and small peptides are included. The text begins with the discoveries and basic concepts of amino acids, peptides, and proteins, and then moves to protein digestion and absorption of peptides and amino acids. Additional chapters cover cell-, tissue-, and species-specific synthesis and catabolism of amino acids and related nitrogenous substances, as well as the use of isotopes to study amino acid metabolism in cells and the body. The book also details protein synthesis and degradation, regulation of amino acid metabolism, physiological functions of amino acids, and inborn errors of amino acid metabolism.
The IFRB Seminar Series, Reproductive Biology Forum, has been held weekly during the Fall and Spring Semesters since 1990. The 2013 IFRB Seminar Series, coordinated by Dr. Qinglei Li, 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 6  Dr. Marcel Amstalden  
Chair IFRB, IFRB General Business Meeting.
September 13  Shavahn Loux, Ph.D. Candidate, Veterinary Physiology & Pharmacology, TAMU, “Hyperactivated motility of stallion spermatozoa: the relationship of calcium and pH.” Hosted by Dr. Katrin Hinrichs.
September 20  Dr. Marcel Amstalden  
Animal Science, TAMU, “Neuroendocrine pathways controlling the onset of puberty in ruminants.” Hosted by Dr. Qinglei Li.
September 27  Dr. Milo Wiltbank, Department of Dairy Science, University of Wisconsin, “Regression of the corpus luteum: molecular mechanisms and practical implications.” Hosted by Dr. Fuller Bazer.
October 4  Dr. Katrin Hinrichs, Veterinary Physiology & Pharmacology, TAMU, “Clinical application of assisted reproduction in the horse.” Hosted by Dr. Qinglei Li.
October 11  Reproductive Biology Retreat (Coordinator: Dr. Qinglei Li)  
Minisymposium speakers: Dr. Beiyan Zhou, Veterinary Physiology & Pharmacology, “Macrophage polarization and insulin resistance.”

Dr. Rajesh C. Miranda, Neuroscience and Experimental Therapeutics, Texas A&M Health Science Center, “microRNAs, fetal brain development and teratology.”
Xiaoqiu Wang, M.S., Animal Science, TAMU, “Arginine and secreted phosphoprotein 1 (SPP1) act synergistically to stimulate MTORC1/ MTORC2 cell signaling and cytoskeletal organization for proliferation, migration and adhesion of ovine trophoderm cells.”
Rodolfo C. Cardoso, D.V.M., M.S., Animal Science, TAMU, “Nutritional and metabolic programming of the onset of puberty in beef heifers.”
Will Frank, M.S., Veterinary Integrative Biosciences, TAMU, “Loss of integrin subunit β3 during the peri-implantation period leads to fetal growth retardation in the sheep.”
Dr. R.O. Berry Memorial Lecture (Coordinator: Dr. Fuller Bazer).
Dr. Duane C. Kraemer, Veterinary Physiology & Pharmacology, “Memories of Dr. Raymond O. Berry.”
Thaddeus G. “Ted” Golos, Ph.D., Professor, Departments of Comparative Biosciences and Obstetrics and Gynecology, and Co-chair, Regenerative and Reproductive Medicine Working Group, Medical and Veterinary Medicine Schools, University of Wisconsin, “The primate maternal-fetal interface: placental interactions with the maternal immune system for programming successful pregnancy outcome.”
October 18  Dr. Bruce Christensen, University of California-Davis, “Reproductive challenges in wild canid captive breeding programs.” Hosted by Dr. Katrin Hinrichs.


September 27  Dr. Qinglei Li  
“Irreversibility of sperm capacitation in the horse,” Hosted by Dr. Qinglei Li.

November 1  Dr. Joe Arosh, Veterinary Integrative Biosciences, TAMU, “Prostaglandin E2 dysregulates microRNAs through epigenetic pathways cross-talk in endometriosis.” Hosted by Dr. Qinglei Li.
November 8  Dr. Beiyan Zhou, Veterinary Physiology & Pharmacology, TAMU, “Non-coding RNA regulation in obesity and insulin resistance.” Hosted by Dr. Qinglei Li.
November 15  Dr. Humphrey Yao, National Institute of Environmental Health Sciences, “How to make a gonad: from cell fate determination to organ formation.” Hosted by Dr. Qinglei Li.
November 22  Dr. Dekai Zhang, Institute of Biosciences and Technology, Texas A&M Health Science Center, “TBA,” Hosted by Dr. Fuller Bazer.
Trainee Spotlight: Wei (Eddie) Ying

Wei (Eddie) Ying, is a second year Ph.D student in the Department of Animal Science, under the mentorship of Drs. Fuller W. Bazer (Department of Animal Science) and Beiyan Zhou (Department of Veterinary Physiology and Pharmacology). He received the B.S. degree in Animal Nutrition from China Agricultural University and the M.S. in Animal Nutrition from Kansas State University. At Texas A&M, his research has been focusing on the regulation of obesity-associated inflammation and insulin resistance, nutrient metabolism during pregnancy, and hematopoiesis. His initial research involved an investigation of arginine metabolism in ovine conceptuses and uteri, under supervision of Drs. Fuller Bazer and Guoyao Wu. His study revealed that arginine can be metabolized by arginine decarboxylase to agmatine and agmatine can be converted by agmatinase in an alternative pathway for synthesis of polyamines in the ovine conceptus and uterus. This was the first evidence for this pathway being active in reproductive tissues of a mammal.

As a joint student of Drs. Fuller W. Bazer and Beiyan Zhou, Eddie expanded his research scope to understand the function of other pregnancy related factors. For example, Eddie found that uteroferin (UF), a pregnancy related cytokine discovered by Dr. Bazer’s lab, can modulate fetal hematopoietic development, specifically, terminal erythropoiesis. His discovery suggests that UF can stimulate red blood cell formation by enhancing the differentiation of erythrocyte progenitors at various stages and the re-

(continued on page 8)
A Snapshot of IFRB Research, Fall 2013

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 5 month period June 1 to November 1, 2013:


Eddie Ying, Trainee Spotlight cont’d. from page 6

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. For example, in the U.S. there are approximately 6.7 million women of reproductive age with impaired fertility (defined as the failure to conceive after a year or more of trying). This has driven the development of assisted reproductive technologies including advances in embryo selection techniques with the goal of providing safer pregnancies and healthier babies. A contrasting challenge is posed by the population of the earth which reached 7 billion people in 2011. Two years later, the population is estimated at 7.2 billion and United Nations demographers predict that the population will reach 9.6 billion by 2050. A surging population is the major driver of increased food demand. To meet rising food demand, revolutionary improvements in plant and animal agriculture are needed. This is driving research in domestic farm species to increase reproductive efficiency considering the fact that high embryonic mortality occurs in an estimated that 20-40% of conceptuses in many farm animal species. Many of the most important challenges facing society today involve issues with reproduction and health including successful outcomes of pregnancy in humans and food animal agriculture, impacts of nutrition and wide ranging environment exposures on chronic diseases in adults, contraception, assisted reproductive technologies, and many others. 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 environmentally relevant and acceptable to the majority of the population is a challenge that requires equal, transdisciplinary collaborations between physicians, osteopaths, veterinarians, dentists, nurses and other professionals in health and environmental sciences.

Members of the Texas A&M University Interdisciplinary Faculty of Reproductive Biology are contributing to the One Health Initiative in many ways as illustrated in the faculty and trainee spotlight articles in this newsletter. Other examples include research being carried out by members of the Uterine Biology and Pregnancy Research Team which performs basic research using domestic farm species and some laboratory animals to investigate the cellular, biochemical and molecular mechanisms of embryonic development, implantation, and placental development to reduce early embryonic loss and improve reproductive efficiency for animal agriculture. However, these basic studies have enormous translational potential to human reproduction, development of healthy offspring along with unexpected applications. One example is the ruminant pregnancy recognition signal, interferon tau (IFNT), discovered by Dr. Bazer’s laboratory that is being studied for its beneficial antiviral effects without the toxicity of other interferons as well as its considerable potential for treatment of autoimmune and immunologically mediated disorders, including Multiple Sclerosis.

As noted in the Trainee Snapshot in this IFRB Newsletter issue, studies carried out by Eddie Ying in the Bazer and Zhou laboratories have identified the novel application potential for this novel interferon to mitigate obesity-associated systemic inflammation and insulin resistance. Another example from the current Newsletter is from the work of graduate student Ted Wing working with Drs. Fuller W. Bazer, Beiyan Zhou, Guoyao Wu, Stephen Safe, Robert Chapkin, and Kathrin Dunlap, as well as the grant support from the United States Department of Agriculture’s National Institute for Food and Agriculture and the American Heart Association.

Reproductive Biology and One Health cont’d.
19th Annual Dr. Raymond O. Berry Memorial Lecture

The Nineteenth Annual Dr. Raymond O. Berry Memorial Lecture was held at the Veranda, Bryan, TX on October 21, 2013. The Annual Raymond O. Barry Lecture series is held in honor of Dr. Raymond O. Barry, 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. Barry made many contributions to the fields of Reproductive Biology and Genetics. Pioneering work of Dr. Barry and his colleagues involved embryo transfer to study sheep/goat hybrids. Dr. Barry 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. Barry’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 immunologically 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 19 years, Dr. Barry’s daughters, Dorothy McMenemy and Margaret Thompson and family members have attended the Lecture as guests. This year, Dorothy and her husband, Dr. Joe McMenemy joined the IFRB for the Lecture, Social and Dinner that followed. Dr. Duane C. Kraemer, Emeritus Professor of Veterinary Physiology & Pharmacology and IFRB member worked with Dr. Barry during his early years as a graduate student. Dr. Kraemer led off the Lecture by providing an entertaining presentation that included memories of Dr. Barry.

Dr. Thaddeus G. “Ted” Golos, Professor in the Department of Obstetrics and Gynecology, University of Wisconsin-Madison Medical School, was selected by a vote of IFRB faculty to present the Annual Berry Memorial Lecture which was entitled, “The primate maternal-fetal interface: placental interactions with the maternal immune system for programming successful pregnancy outcome.”

Dr. Golos received the B.S. in Biology from Marquette University, and the M.S. and Ph.D. from the University of Illinois in Physiology and Biophysics. He then moved to the University of Pennsylvania, Department of Obstetrics and Gynecology as a USPHS Postdoctoral Fellow in the Division of Reproductive Biology in the laboratory of Dr. Jerome F. Strauss III. He accepted an academic position at the University of Wisconsin-Madison, Wisconsin National Primate Research Center in 1987 and has since risen through the academic ranks to Professor in the University of Wisconsin-Madison Medical School, Department of Obstetrics and Gynecology and in the School of Veterinary Medicine, Department of Comparative Biosciences. He is also the co-chair of the Regenerative and Reproductive Medicine Working Group at the Primate Center.

Dr. Golos was recipient of an NIH Predoctoral National Research Service Award in Reproductive Biology as well as Cellular and Molecular Biology at the University of Illinois, an NIH Individual Postdoctoral National Research Service Award at the University of Pennsylvania, a NIH FIRST Award while at the University of Wisconsin, and he has been named as a NICHD Lecturer by the Perinatal Research Society and NIH Lecturer by the International Federation of Placenta Associations. Since 1994, Dr. Golos has served on many review panels for the NIH, particularly NICHD and NCCR, including as a full member of the Biochemical Endocrinology Study Section from 1997-2001, as a member of more than 20 Special Review Panels, including for US4 Collaborative Research Centers in Reproduction, R20 Stem Cell Development Centers, NCCR R24 Review Panels, and as an ad hoc review for the Pregnancy and Neonatology and Reproductive Biology Study Sections. He has mentored 10 postdoctoral fellows, served on graduate committees for 22 graduate students and mentored 36 undergraduate students in research projects. Accordingly, he is a member of graduate training programs in Endocrinology and Reproductive Physiology.

From left to right: Dr. Joe McLemore, Obstetrician / Gynecologist in Houston, Texas, Mrs. Dorothy McMenemy, daughter of Dr. Berry; Dr. Duane C. Kraemer, Emeritus 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. Dr. Ted Golos, the 19th Lecturer in the Series, 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. Marcel Amstalden, Chair, IFRB; Dr. Qingli Li, Organizer of the IFRB Retreat, held in conjunction with the Lecture.

From left to right: Dr. Joe McLemore, Obstetrician / Gynecologist in Houston, Texas, Mrs. Dorothy McMenemy, daughter of Dr. Berry; Dr. Duane C. Kraemer, Emeritus 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. Dr. Ted Golos, the 19th Lecturer in the Series, 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. Marcel Amstalden, Chair, IFRB; Dr. Qingli Li, Organizer of the IFRB Retreat, held in conjunction with the Lecture.

“Dr. Berry’s pioneering studies contributed basic knowledge about maternal immune recognition of the fetal placental unit.”

-Fuller W. Bazer
In vitro-produced equine blastocyst produced by intracytoplasmic sperm injection (ICSI) - Image provided by Drs. Young-Ho Choi and Katrin Hinrichs

**Onkwar Sawant** recently complete doctoral degree requirements in Biomedical Sciences working with **Drs. Timothy Cudd and Shannon Washburn**. The title of his dissertation is “Effects of Maternal L-glutamine Supplementation on the Fetus to Mitigate Teratogenic Effects of Alcohol.” Three manuscripts from his work have been published in 2013 including a senior authored paper in the Sept., 2013 issue of Alcohol Clin Exp Res entitled “The role of acidemia in maternal binge alcohol-induced alterations in fetal bone functional properties,” was co-authored with Drs. J Ramadoss, HA Hogan, and SE Washburn.

**Irene Ruiz-Gonzalez, DVM, PhD**, recently completed post-doctoral studies and left the Laboratory of Uterine Biology and Pregnancy last August after being recruited by IVIOMICS, a Spanish company that provides advanced services in human reproductive genetics worldwide. Irene is currently in training within the Department of Pre-implantational Genetic Diagnosis and Molecular Cytogenetics with the objective of being appointed Lab Manager of the next international location where the company plans to open, after the successful inauguration of Miami and India labs.

**William Cromwell** is a new graduate student working in the Laboratory of **Dr. Mark Westhusin** who is the recipient of a CVM Merit Scholar Fellowship. His research is focused on the use of the mammary glands in goats for rapid production large amounts of proteins. One application is for the rapid production of vaccines when time is a critical factor in halting the spread of pathogens.

**Sicilia T. Grady, DVM, MS**, is a new PhD candidate in the laboratory of **Dr. Katrin Hinrichs**. After completing high school in Mexico she obtained her B.S. degree from the University of California-Davis and her Master’s Degree from Texas A&M University. She attended veterinary school at Colorado State University, and after a one-year internship in private practice she is back at TAMU. Dr. Grady is currently focusing on oocyte recovery and therapies to improve fertility in mares.

**Yang Gao** received a CVM Outstanding Student Scholarship. Yang works in the laboratory of **Dr. Qinglei Li**.

**Paola S. Tinetti Pinto, DVM, MS**, recently joined the laboratory of **Dr. Katrin Hinrichs**. She earned her Veterinary Medicine degree at Universidad de El Salvador, and her MS degree in Veterinary Sciences at the Universidad Complutense de Madrid, Madrid, Spain. Prior to joining Dr. Hinrich’s lab, she spent 5 years in wild animal species conservation and completion her MS working with primordial follicles in coculture with stromal cells to study preantral folliculogenesis in lambs. In Dr. Hinrichs lab she will be working with pluripotent stem cell production to generate an alternative method to facilitate endangered wild equine species preservation.

**Curtis Korthanke** recently joined the laboratory of **Dr. Gary Williams** to start the M.S. program in Physiology of Reproduction. He earned a B.S. in Animal Science in August, 2013 and worked as student worker with **Dr. Steven Brinsko**, Professor of Theriogenology in the CVM. He will investigate the role of the RF-amide related peptides in seasonal reproduction in the mare.

**Marcella D’Oliveira**, a doctoral student at the Federal University of Mato Grosso do Sul, Brazil, under the supervision of Dr. Gumercindo Franco, joined the laboratory of **Dr. Marcel Amstalden** for a one-year research fellowship funded by CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior), Brazil. Marcella has a B.S. and M.S. in Animal Science from the Federal University of Mato Grosso do Sul, and will be investigating the role of neurokinin B in the maturation of the reproductive neuroendocrine system of ewe lambs.

**Dakshnapriya Balasubramanian** joined **Dr. Joe Arosh**’s lab in May, 2013. Her research is focused on the epigenetic regulation of small noncoding RNAs (microRNAs) and long noncoding RNAs (lncRNAs) in the pathogenesis of endometriosis. She received her undergraduate degree in Industrial Biotechnology Anna University, India and an MS at Georgetown University in May, 2012. She also received a TAMU Walter W. Lechner Estate Lechner Scholarship in 2013.

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**Marcella D’Oliveira**, a doctoral student at the Federal University of Mato Grosso do Sul, Brazil, under the supervision of Dr. Gumercindo Franco, joined the laboratory of **Dr. Marcel Amstalden** for a one-year research fellowship funded by CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior), Brazil. Marcella has a B.S. and M.S. in Animal Science from the Federal University of Mato Grosso do Sul, and will be investigating the role of neurokinin B in the maturation of the reproductive neuroendocrine system of ewe lambs.

**Dakshnapriya Balasubramanian** joined **Dr. Joe Arosh**’s lab in May, 2013. Her research is focused on the epigenetic regulation of small noncoding RNAs (microRNAs) and long noncoding RNAs (lncRNAs) in the pathogenesis of endometriosis. She received her undergraduate degree in Industrial Biotechnology Anna University, India and an MS at Georgetown University in May, 2012. She also received a TAMU Walter W. Lechner Estate Lechner Scholarship in 2013.
The 7th Annual IFRB Retreat was held on October 11, 2013 in conjunction with the 19th Annual Dr. Raymond O. Berry Memorial Lecture. Over 65 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 Veranda in Bryan, TX. The organizer of the retreat was Dr. Qinglei Li, Assistant Professor, Veterinary Integrative Biosciences.

Highlights of the Retreat included Mini-symposia presentations by IFRB Faculty and Trainee members: Dr. Beiyan Zhou, “Macrophage polarization and insulin resistance,” Dr. Rajesh C. Miranda, “microRNAs, fetal brain development and teratology,” Xiaqiu Wang, “Arginine and secreted phosphoprotein 1 (SPP1) act synergistically to stimulate MTORC1/ MTORC2 cell signaling and cytoskeletal organization for proliferation, migration and adhesion of ovine trophoderm cells.” Dr. Rodolfo C. Cardoso, “Nutritional and metabolic programming of the onset of puberty in beef heifers.” Will Frank, “Loss of integrin subunit β3 during the peri-implantation period leads to fetal growth retardation in the sheep.”

There were also 20 posters were presented by trainees during the retreat. For the fourth year in a row, Dr. Davey Griffin and members of the Texas A&M Department of Animal Science, Drs. Mark Hussey and Alan Sams, College of Agriculture and Life Sciences, Dr. John Stal- lone, Department of Veterinary Physiology and Pharmacology, Dr. Paul Ogden, College of Medicine, and Dr. Fuller Bazer, through his Distinguished Professor account.

Save the Dates

The 20th Annual Meeting of the Texas Forum for Reproductive Sciences will be held at the UTSA Downtown Campus in San Antonio on April 17-18, 2014.


NEW GRANTS:
*Dr. Joe Arosh recently received notice of a new USDA AFRI grant entitled, “The Role of Intraluteal Prostaglandins in Luteolysis and Luteal Protection in Sheep.”
*Dr. Beiyan Zhou recently received a $1.54 million grant from the National Institutes of Health-National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)-part of the to study the role of microRNA in diabetes.
*Drs. Gary Williams and Marcel Amstalden recently received a new USDA AFRI grant entitled, “Prenatal Control of Nutritionally-Accelerated Puberty in Heifers.”

AWARDS & HONORS:
*Dr. Kayla J. Balyess began service as a chartered member of the National Institutes of Health, Atherosclerosis, Inflammation, and Cardiovascular Sciences (AICS) Study Section on July 1, 2013. The term will run through June 30, 2019.
*Dr. Greg A. Johnson received an Association of Former Students, College Level Distinguished Achievement Award for Teaching.
*Dr. Qinglei Li has been invited to serve on the Board of Reviewing Editors of Biology of Reproduction.

INVITED LECTURES
*Dr. Marcel Amstalden an invited speaker for the Reproduction Symposium: External Influences on Reproductive Neuroendocrinology. ADSA/ASAS joint annual meeting, Indianapolis; July, 2013. The title of his lecture was “Neuroendocrine programming of accelerated puberty in heifers.”
*Dr. Greg A. Johnson was also invited to participate in the Reproductive Biology Fall 2013 Seminar Series, at the University of Missouri, October 23, 2013. His talk was entitled, “Osteopontin and its integrin receptors physically and functionally modify the uterus and placenta to support pregnancy.”

INTERNATIONAL ACTIVITIES:
*Dr. Kayla J. Balyess was invited to speak at the International Union of Physiological Sciences (IUPS Conference) in Birmingham (U.K.) from July 21-26, 2013 and presented a talk entitled, “The intermediate filament cytoskeleton plays a key role in endothelial sprout initiation.”
*Dr. Fuller W. Bazer was invited to present lectures at the following international meetings: - 9th International Conference on Pig Reproduction titled “Roles of selected nutrients on development of the conceptus during pregnancy,” Olsztyn, Poland, June 9-12, 2013.
- “Pregnancy Recognition in Rumnants and Pigs,” World Congress on Animal Production 2013, Beijing, Peoples Republic of China and served as Chair of Session on Physiology on October 18, 2013.

IRFB Faculty Activities, Awards, etc.

On Oct 12-13, 2013 the Equine Reproduction group, (Drs. Terry Blanchard, Stephen Brinske, Katrin Hinrichs, Charles Love, and Dickson Yamer), presented a short course to over 100 producers who have donated to the Legends Premier Stallion Service Auction, that funds research in equine reproduction at the CVM. Topics included techniques for semen processing, evaluation of stallion breeding records, management of the pregnant and foaling mare, and clinical application of ICSI, with demonstrations given the following day.
juvenile development. To achieve these objectives, his aims are to: 1) define genotypes of fertility-related loci in bucks based on observed fertility phenotypes. 2) Characterize the genes involved in the normal developmental program of the male reproductive tract in goats during fertility phenotypes, 2) Characterize the genes involved in the normal developmental program of the male reproductive tract in goats during fertility phenotypes. To achieve these objectives, his aims are to: 1) define genotypes of fertility-related loci in bucks based on observed fertility phenotypes. 2) Characterize the genes involved in the normal developmental program of the male reproductive tract in goats during fertility phenotypes.

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Gamete and Embryo Biology, Cellular and Molecular Biology, Environmental Toxicology, Hematology Training Program, Stem Cell Training Program, Medical Scholars Training Program, Comparative Biomedical Sciences Training Program, and Cellular and Molecular Pathology Training Program.

In service to his professional societies, Dr. Golos is a member of the Executive Committee of the American Society for Reproductive Immunology and has served as a member of the editorial boards for Journal of Molecular Endocrinology, Placenta, and the American Journal of Reproductive Immunology. He has been funded continuously by grants from the NIH since 1989, and his current research is funded by NIH grants to study Primate Placental Immunogenetics, Transgenic Marmosets for Translational Research, and by the University of Wisconsin Medical School to study Decidual Listeriosis and pregnancy loss. From his research, Dr. Golos has published 96 refereed journal articles and 12 book chapters, and presented many invited seminars and lecture at prestigious meetings at the national and international levels. Dr. Golos research currently focuses on maternal-fetal immune interactions, primate transgenesis, and placental infection, inflammation and pregnancy loss.

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