The MU Livestock Engineering Team (MULE Team) leveraged the existing swine expertise to obtain the second of only two NIH funded Swine Centers. Dr. Kevin Wells was the lead investigator on obtaining funding for the University of Missouri Swine Somatic Cell Genome Editing Center which is part of the NIH Somatic Cell Genome Editing Consortium (SCGE). The SCGE Consortium is supported by the NIH Common Fund through cooperative agreements administered by the National Center for Advancing Translational Sciences, NIH Office of the Director, National Heart, Lung, and Blood Institute, National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institute of Neurological Disorders and Stroke, National Institute of Allergy and Infectious Diseases, National Human Genome Research Institute, and National Institute of Biomedical Imaging and Bioengineering. The consortium is managed by a trans-NIH working group representing multiple NIH Institutes and Centers.

The role of the Genome Editing Testing Centers is to validate unique reporter models created by the Animal Model Production Section and to test novel delivery methods and reagents provided by other members of the Somatic Cell Genome Editing Consortium. Additionally, the Genome Editing Testing Center is responsible for creating detailed
Continued from page 1

standard operating procedures and comprehensive reports for testing new genome editing technologies. It is essential to have a well-established pipeline for proper refinement of the tools while ensuring the safety of the technology. The Genome Editing Testing Center streamlines the testing process while maintaining a comprehensive and rigorous comparative analysis of new genome editing tools and delivery systems. The University of Missouri reproductive group was ideally suited to provide this testing due to our unique composition of individuals that are experienced with pig production, swine biomedical models, operate successful labs that routinely test cutting-edge genome editing technology, and are associated with world-renowned National Swine Resource and Research Center (NSRRC). The Genome Editing Testing Center will have a significant impact on the overall MU Swine Testing Center for Genome Editing Technologies’ ability to accurately assess new technologies and further facilitate the ability to use genome editing in therapeutic circumstances.

History of Reproduction Focus on Ruminant ET

The first calf resulting from an in vitro fertilized oocyte and in vivo capacitated sperm was born in 1981 (Brackett et al., 1982). Fukuda et al. (1990) were the first to produce a calf born following transfer of blastocysts formed from in vitro matured oocytes that were fertilized and cultured in vitro. Neal First was one of the early pioneers of in vitro fertilization in cattle (First, 1987). In the 1980s, embryo splitting was developed as a method of cloning ruminants (Fehilly and Willadsen, 1986). Johnson et al. (1995) produced quadruplet calves from a 4-cell embryo; however, the limited number of clones generated from this technique provided impetus for the development of other cloning methods. Research from Neal First’s lab and others (Foote, 1987; Seidel, 2015) established methods to transfer nuclei to oocytes to create clones. Transfer of nuclei from 8 to 16 cell embryos resulted in the live birth in sheep (Willadsen, 1986) and cattle (Prather et al., 1987). These studies clearly laid the foundation for the historical birth of “Dolly” following somatic cell nuclear transfer of an adult donor cell (mammary cell line; Wilmut et al., 1997). This stunning achievement accelerated advancements in somatic cell nuclear transfer and the use of genetically modified donor cells. However, 20 yr after the birth of Dolly, the impact of her birth has done more to stimulate advances in stem cell biology than cloning of domestic ruminants. The first transgenic mammals were mice generated from oocytes microinjected with metallothionein-growth hormone genes (Palmiter et al., 1982). Since that time, a variety of techniques have been used to introduce foreign DNA into cells including retroviruses, pronuclear microinjection, and embryonic stem blastocyst injection. Utilization of homologous recombination and somatic cell nuclear transfer has been used to produce transgenic cattle (Cibelli et al., 1998), sheep (Schnieke et al., 1997), and goats (Keefer et al., 2001). More recently, development of nucleases that provided greater precision in cleaving DNA such as zinc finger nucleases, TALENS and CRISPRs have improved the rate and efficiency of producing transgenic animals (Wells, 2016).
Engineering of the mammary gland of cows to be resistant to Staphylococcus aureus infection is one example of using biotechnology to improve animal health (Wall et al., 2005). The development of CRISPR gene-edited pigs resistant to porcine reproductive and respiratory syndrome virus has provided a blueprint for improving animal health (Whitworth et al., 2016). As with the AI technique, the goal of genetic improvement was a driving force for the research underlying development of the embryo transfer technique, in vitro fertilization, and cloning.


Dr. Amanda Patterson is an Assistant Professor in the Division of Animal Sciences with a joint appointment in the Department of Obstetrics, Gynecology and Women’s Health. Amanda’s background is in female reproductive physiology with her primary area of expertise being mechanisms of uterine regeneration/repair and associations with disease. Her passion for reproductive biology began as an undergraduate when she acquired a work-study position in Dr. Terry Nett’s lab at Colorado State University (CSU), studying the hypothalamic-pituitary-gonadal signaling axis. From there she obtained a Master’s Degree under the guidance of Dr. Jason Bruemmer and Dr. Thomas Hansen in Animal Sciences at CSU for her work on maternal recognition of pregnancy in mares. She then earned a Ph.D. in Animal Sciences at Washington State University (WSU) with Dr. Jim Pru where she studied early pregnancy, specifically implantation and decidualization, and also endometrial regeneration. It was in Dr. Pru’s lab that Amanda was first introduced to stem cell biology and she quickly developed an interest in understanding how stem cells function in normal endometrial biology. For her postdoctoral studies, she joined the laboratory of Dr. Jose Teixeira at Michigan State University (MSU). In Dr. Teixeira’s lab, she continued to study uterine stem cells and extended her research to include the myometrium. Specifically, she developed protocols to identify putative stem cells in the myometrium using mouse and human models, which enabled her to assess their contribution to formation of leiomyomas (benign smooth muscle tumors). Her work was supported by a NRSA (F32) awarded by the NICHD. She also had the opportunity to study several other areas of reproductive biology and associated diseases including the role of β-catenin on embryo implantation and endometrial decidualization, PTEN and LKB1 on benign prostatic hyperplasia, and nuclear PTEN activity in endometrial cancer.

Patterson’s current research program is focused on understanding how the uterus is repaired after menstruation in women and following pregnancy and parturition. Of particular interest is the activity of adult uterine stem cells and a unique process called mesenchymal-epithelial transition. Patterson has characterized putative myometrial and epithelial stem cells during pregnancy and in a menses-like model using mice. This work will be continued by her Master’s student, Maddie Spooner. She has also used the menses-like mouse model to show that stromal (i.e. mesenchymal) cells transition into luminal and glandular epithelial cells as a mechanism to repair the epithelium. In another project, Patterson identified putative mesenchymal stem cells in

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the myometrium and in fibroids of women. Yasser Lenis, a postdoc in Patterson’s lab, will be continuing this work and will be assessing the role of Periostin, an extracellular matrix protein, in fibroid growth. Patterson’s overarching research goal is to gain a greater understanding of normal mechanisms of uterine repair to advance our understanding of how these processes could lead to various diseases of the uterus when not properly regulated.

Dr. Ahmed Balboula is an assistant professor of Reproductive Biology in the Division of Animal Sciences. Ahmed graduated from the Faculty of Veterinary Medicine, Mansoura University, Egypt. He obtained a Master’s degree from the same university for his work on improving the quality of vitrified bovine oocytes. Ahmed then moved to Japan to conduct his Ph.D. research in the laboratory of Dr. Masashi Takahashi (University of Hokkaido, Japan) through channel system scholarship between Mansoura University, Egypt and the National Agricultural Research Center, Japan. His Ph.D. studies focused on improving the quality of bovine oocytes through regulating the apoptotic pathway, an important goal for efficient in vitro embryo production system. Through this Ph.D. work, Ahmed realized that to meet his goals of improving the quality of mammalian oocytes, he had to first understand the molecular mechanisms that regulate their important cellular events. To get this training, for his postdoctoral studies, Ahmed joined the laboratories of Dr. Richard Schultz at the University of Pennsylvania and Dr. Karen Schindler at the University of Rutgers and chose projects that expanded his model system repertoire to include mice, studying and identifying major regulators that drive faithful chromosome segregation to avoid the development of aneuploid embryos. Funded by a Marie Curie Individual Fellowship, Ahmed moved to the University of Cambridge in the UK to join the laboratory for Dr. David Glover. His research in Cambridge focused on understanding the role of F-actin on microtubule organizing center (MTOC) clustering and sorting during oocyte meiosis. Today, his current research program focuses on understanding two major challenges during oocyte meiosis: how the bipolar spindle, which lack classic centrosomes, is assembled and positioned and why the DNA damage response is not robust. And importantly how these processes are regulated to prevent abnormal chromosome segregation and the development of aneuploid gametes, that can result in infertility, miscarriages or developmental disorders. Ahmed’s long-term goal is to combine his training in both basic and applied research along with his expertise in genetics as powerful tools to answer fundamental biological questions relates to fertility, cell cycle and cancer research.

Dr. Sofia Ortega was recently hired to a faculty position in the Division of Animal Sciences. Dr. Ortega was postdoctoral fellow in the laboratory of Dr. Tom Spencer at the Division of Animal Sciences, University of Missouri. Sofia completed a Bachelor of Agricultural Sciences at Zamorano Agricultural University in Honduras. Before starting graduate school, she worked as the manager of a bull stud owned by the National Cattlemen Association in Honduras. In 2009, she moved
Sciences where she studied a polymorphism in the Kappa-casein gene and its association with milk composition, and cheese yield in Holstein and Montbeliarde-Holstein cows. She got her Ph.D. at the University of Florida in 2016 under the supervision of Dr. Peter Hansen; and her research focused on the study of genes involved in female reproductive function and embryonic development in dairy cattle. One of her major research interests is the use of novel genomic approaches to understand complex phenotypes in cattle.

Dr. Thomas Spencer was recently elected to the National Academy of Science. A major focus of his research is to elucidate the molecular pathways that mediate the interactions between the uterus and the conceptus, regulating pregnancy recognition and successful implantation and to translate that knowledge to improve the fertility and health of agricultural animals and humans. Spencer’s laboratory has made seminal and important discoveries enhancing our understanding of the regulatory processes associated with the establishment of pregnancy and development of the placenta in a variety of animal models including sheep, cattle and mice. He has provided novel discoveries to the biological pathways involved with development of uterine glands and the role of uterine glands in pregnancy which only not pertains to large farm animals but human biomedical sciences and fertility in women. Dr. Spencer helped develop the “uterine gland knockout” sheep model, which revealed that endometrial glands secrete or transport bioactive substances that regulate uterine receptivity for blastocyst implantation in domestic animals. His research team used genetically engineered mouse models to establish that the transcription factor Forkhead box a2 (FOXA2) is a key regulator of postnatal uterine gland differentiation. His laboratory has also revealed a previously unrecognized role for FOXA2 in regulation of adult uterine functions during pregnancy, specifically in blastocyst implantation and stromal cell decidualization. Dr. Spencer continuously received grant support from the United States Department of Agriculture National Institute of Food and Agriculture and the National Institutes of Health totaling more than $20 million.
Society for the Study of Reproduction
52nd Annual Meeting of the Society for the Study of Reproduction was held at the San Jose McEnery convention Center in San Jose, California on July 18-21, 2019.

Nineteen trainee’s abstracts were accepted for either poster presentation at the Annual SSR Meeting. Raissa Cecil, Paula Chen, Lauren Cienia, Pramod Dhakal, Harriet Fitzgerald, Karl Kerns, Rowan Karvas, Fyath Kumro, Jiude Mao, Megan McLean, Jessica Milan-Foster, Joao Moraes, Eleanore O’Neil, Caroline Pfeiffer, Amanda Schelzle, Katy Stoecklein, Grace Wiley, Michael Zigo, and Dalen Zuidema presented posters of their research. Drs Karl Kerns, Michael Zigo, and Harriet Fitzgerald and graduate trainee’s Pula Chen, Amanda Schmelzle and undergraduate Grace Wiley were invited to present a Flash Talk to highlight their posters during the SSR meeting. Harriet Fitzgerald’s poster entitled “The Development of a Uterine Gland 3D Culture Model to Understand Pregnancy Establishment in Women” was selected for the Trainee Research Poster Finalist Competition which Harriet received third place.

Caroline Pfeiffer and Jason Rizo (5th and 6th from the right) were recipients of the USDA NIFA-AFRI Merit Award.

Harriot Fitzgerald, Karl Kerns and Grace Wiley (back row 4th, 5th and 6th from left) received the SSR Trainee Travel Award.

Dr. Thomas Spencer was invited to provide a Focus Session presentation entitled “Comparative Insights into How Uterine Glands Function in Pregnancy Establishment.”

Greenwald Symposium

The Gilbert S. Greenwald Symposium on Reproductive and Regenerative Medicine was held at the KU Medical Center in Kansas City, MO on October 18-19, 2018. Trainees Eleanore O’Neil and Harriot Fitzgerald presented research posters. Eleanore O’Neil received recognition as Trainee Award Winner for best poster during the meeting. Caroline Pfeiffer was selected to make a Trainee Oral Presentation entitled “Biological Role of Prostaglandin Synthase 2 (PTGS2) on Early Conceptus Development in Pigs” during the symposium.
**Trainee Highlights**

**Karl Kerns**, Ph.D. trainee in Dr. Sutovsky’s laboratory received 1st place for the University of Missouri Lifesciences Week poster competition and received IowaSTATEment Maker award from the ISU Alumni Association. Karl was awarded a USDA NIFA Predoctoral Fellowship.

**Eleanor O’Neil**, a Ph.D. trainee in Dr. Thomas Spencer’s laboratory received 1st place for her Ph.D. poster presentation during the Division of Animal Science ASGA Graduate Research Forum and received recognition as Trainee Award Winner for best poster during the meeting during the Gilbert S. Greenwald Symposium.

**Caroline Pfeiffer**, M.S. trainee in Dr. Rodney Geisert’s was selected to make an Oral Presentation during the 2018 Greenwald Symposium at the KU Medical Center in Kansas City symposium and received a USDA NIFA-AFRI Merit Award during the SSR meeting in San Jose, CA.

**Amanda Schmelze**, M.S. trainee in Dr. Jon Green’s laboratory received 3rd place for her MS oral presentation during the Division of Animal Science ASGA Graduate Research Forum.

**Katy Stoecklein**, M.S. trainee in Dr. Randy Prather’s laboratory received 1st place for her MS poster presentation during the Division of Animal Science ASGA Graduate Research Forum.

**Paul Chen**, Ph.D. trainee in Dr. Randy Prather’s laboratory received 2nd place for her Ph.D. poster presentation during the Division of Animal Science ASGA Graduate Research Forum. Paula was awarded a USDA NIFA Predoctoral Fellowship “Investigating mTORC1 Activation Mechanisms and Its Role in the Viability of Early Porcine Embryos.”

**Raissa Cecil**, M.S. trainee in Dr. Randy Prather’s laboratory received 1st place for her MS poster presentation during the Division of Animal Science ASGA Graduate Research Forum.

**Jessica Milan-Foster**, Ph.D. trainee in Dr. Thomas Spencer’s laboratory received 3rd place for her poster presentation during the Division of Animal Science ASGA Graduate Research Forum.

**Dr. Hariet Fitzgerald**, Post-doc in Dr. Thomas Spencer’s laboratory received 3rd place for her poster entitled “The Development of a Uterine Gland 3D Culture Model to Understand Pregnancy Establishment in Women” was selected for the Trainee Research Poster Finalist Competition.

**Dusti Shay**, PhD trainee in Dr. Victoria Vieira-Potter laboratory present an invited oral presentation “Sex Differences in NAc Brain Region Gene Networks Associate with Adiposity and Physical Activity” during The Obesity Society Annual Meeting in Las Vegas, NV.
Rachael Bonacker started her joint MS/DVM program with Dr. David Patterson in Spring of 2019. Rachael is from a farm in Cedar Hill, MO. She received her BS from the University of Missouri and will continue her DVM program at the MU College of Veterinary Medicine in Spring of 2020.

Ben Nelson will begin his MS program in the laboratory of Dr. Green in August, 2018. Ben grew up in Dallas, Texas. He completed his bachelor’s degree in Animal, Dairy, and Veterinary science from Utah State University. Ben is currently working on a porcine Pregnancy Associated Glycoprotein gene knockout project.

Emily Smith started her joint MS/DVM program with Dr. Thomas Jordan this past summer. Emily is from Cape Girardeau, MO. She received her BS from the University of Missouri and will begin her DVM program at the MU College of Veterinary Medicine this Fall.

Jacob Pearson joined Dr. Thomas Spencer laboratory to initiate his MS program this past summer. Jacob is from Kansas City, MO, received his BS from the Department of Animal Science at Oklahoma State University this past spring.

Alana Rodney will begin her MS program in the laboratory of Dr. Warren in August, 2019. Rodney, a native of Baton Rouge, Louisiana, received her BS from the Department of Biology at MU this past spring. She will undertake research to evaluate the genetics of companion animal cancers when compared to human using genomic approaches, including single cell technology.

Carson Andersen grew up in Spring, Texas and graduated from Texas A&M University in the Spring of 2019 with a BS in Animal Science. Carson started her MS program this summer under the direction of Dr. Jordan Thomas, with research involving control of the estrous cycle in beef cattle.

Madelyn Spooner is originally from Alton, IL. She received her B.S. in Biology at Southern Illinois University - Edwardsville and most recently earned her B.S. in Animal Sciences at Ohio State University this year. She will begin her M.S. degree in the laboratory of Dr. Amanda Patterson working to identify and characterize epithelial stem cells in the endometrium.

Jenna Kalleeberg recently joined the Schnabel laboratory to pursue a Ph.D. She previously graduated from MU with a B.S. in Animal Sciences in 2013. While working in IDEXX’s PCR diagnostic lab, she became interested in the evolution of host-pathogen interactions for zoonotic diseases, specifically the role of agricultural animals in this pathway. She is eager to learn computational and comparative genomics approaches which enable investigation of complex traits, such as disease resistance.”

Kelsey Clark, originally from Fairview, TX completed her B.S. in Animal Sciences from Purdue University. She worked for the USDA-ARS in West Lafayette during her undergraduate with a focus on dairy cattle immunology. She will begin her M.S. in Fall of 2019 under Dr. Ortega and Dr. Spencer studying sire effects on bovine embryo development.

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Jason Rizo is a native of Nicaragua and graduate of Zamorano Agricultural University (Honduras). He completed his MS in Animal Molecular and Cellular Biology at the University of Florida. Jason recently started his Ph.D. under the supervision of Dr. Sofia Ortega. His research focuses on understanding paternal contributions to the physiology and genetics of pregnancy establishment in bovine.

Jessica Kincade received her B.S. in Agricultural Science from Truman State University in 2019. She started her M.S. degree in the laboratory of Dr. Ahmed Balboula, August 2019. Her M.S. research focuses on understanding the relationship between abnormal spindle positioning and aneuploidy during oocyte meiosis using mouse as a model system.

Daniela Londono Vasquez received her Doctor of Veterinary Medicine in 2014 from the University of Antioquia, Colombia and specialized in Biotechnology with an emphasis on in vitro production of bovine embryos. Daniella then moved to Spain where she was a research fellow at the University of the Basque Country prior to getting her M.S. degree in Veterinary Sciences from Antioquia University. She worked as an instructor of Animal Biotechnology at Antioquia University since 2016. Throughout her career, she got an extensive experience in Reproductive and Animal Biotechnology where she worked as a laboratory coordinator and advisor for many laboratories in different countries including Colombia, Mexico, Peru and Uruguay. Daniela started her position as a Research Scholar in the laboratory of Dr. Balboula this fall. Her research will focus on understanding molecular mechanisms regulating spindle positioning and asymmetrical cell division in mouse oocytes.

Dr. Yasser Lenis received his degree in Veterinary Medicine in 2006 and specialized in bovine reproduction and human physiology. In 2009, he received his M.S. degree in Animal Science from Antioquia University. Following that, he worked as an Instructor of Animal Reproduction in several universities in Colombia and Ecuador from 2009 to 2014. In August 2014, he won a scholarship from the Colombian government and Texas A&M University to earn his Ph.D. At Texas A&M University he worked with Dr. Fuller Bazer on his dissertation research evaluating the impact of knockdown of the major proteins in the arginine, agmatine and polyamine synthesis pathways and the effects on growth and development of ovine conceptuses during the peri-implantation period of pregnancy. In 2017, he completed his Ph.D. and received his degree from Antioquia University. Most recently he worked as a Research Fellow at the University of Florida, evaluating reproductive performance in Brahman Heifers. Now Yasser has joined Dr. Amanda Patterson’s lab as a Post-Doctoral Fellow. He is evaluating the role of Periostin, a regulatory protein present in the extracellular matrix, on formation of benign tumors of the myometrium (leiomyomas). Additional research will focus on mesenchymal stem cells in uterine function.
R. Michael Roberts, Ph.D., Chancellor’s Professor, Division of Animal Sciences, University of Missouri. **Wednesday, September 18, 2019 at 3:30 pm in 103 ASRC.**  
Title: “Common immune checkpoints of cancer and placental trophoblast.”

Rodney Geisert, Ph.D., Professor, Division of Animal Sciences, University of Missouri. **Wednesday, September 25, 2019 at 3:30 pm in 103 ASRC.**  
Title: “CRISPR/Cas9 technology provides a new perspective for the role of conceptus genes involved with the establishment of pregnancy in the pig.”

Gail Prins, Ph.D., Professor, Departments of Urology and Pathology, College of Medicine, University of Illinois at Chicago. **Wednesday, October 2, 2019 at 3:30 pm in 103 ASRC.**  
Title: “Prostate stem cells as EDC targets that increase cancer susceptibility.”

John Soley, Ph.D., Professor, Department of Anatomy and Physiology, Faculty of Veterinary Science, University of Pretoria, South Africa. **Wednesday, October 9, 2019 at 3:30 pm in 103 ASRC.**  
Title: “A little package, big impact: The role of spermatology in nature conservation and phylogeny.”

Ye Yuan, Ph.D., Senior Scientist, Colorado Center for Reproductive Medicine, and Department of Biomedical Science, Colorado State University. **Wednesday, October 23, 2019 at 3:30 pm in 103 ASRC.**  
Title: “Dynamics of trophoblast differentiation in peri-implantation stage human embryos.”

Andrea Cupp, Ph.D., Professor, Department of Animal Sciences, University of Nebraska. **Wednesday, October 30, 2019 at 3:30 pm in 166 ASRC.**  
Title: “Inflammation: A common theme of women and cows with polycystic ovary syndrome-like phenotypes.”

Rebecca Krisher, Ph.D., Research Director, Colorado Center for Reproductive Medicine. **Wednesday, November 6, 2019 at 3:30 pm in 103 ASRC.**  
Title: “Metabolic pathways controlling pre-implantation embryo development and viability.”

Joao Moraes, Ph.D., Postdoctoral Fellow, Division of Animal Sciences, University of Missouri. **Wednesday, November 13, 2019 at 3:30 pm in 103 ASRC.** Host: Matt Lucy.  
Title: “Single-nuclei RNA sequencing reveals heterogeneity in bovine uterine cells and unveiled cell type-specific transcriptome changes during the estrous cycle.”

Romana Nowak, Ph.D., Professor, Department of Animal Science, University of Illinois. **Wednesday, November 20, 2019 at 3:30 pm in 103 ASRC.**  
Title: “Basigin: a multifunctional protein that is necessary for normal fertility.”

Ahmed Balboula, Ph.D. Assistant Professor, Division of Animal Sciences, University of Missouri. **Wednesday, December 4, 2019 at 3:30 pm in 103 ASRC.**  
Title: “A new model for asymmetric cell division in mammalian eggs.”

Thorold Theunissen, Ph.D. Assistant Professor, Department of Developmental Biology, Washington University School of Medicine in St. Louis. **Wednesday, December 11, 2018 at 3:30 pm in 103 ASRC.**  
Title: “Understanding human pluripotent states and their applications.”
Faculty Awards, Honors and Grants

Faculty Awards

Randy Prather, Kristen Whitworth and Kevin Wells received the Bar Association of Metropolitan St. Louis’s 2019 Inventors of the Year in the “Established Companies” category.

Mathew Lucy received the 2019 American Dairy Science Association Fellow Award.

Thomas Spencer was selected to be a member of the National Academy of Sciences.

Bob Schnabel was involved with a genomics consortium group that received the 2018 Mid-Continent Regional Federal Laboratory Consortium (FLC) award for “Combining Technologies to Transfer a Reference Genome Assembly for Cattle”.

Faculty Honors

Mathew Lucy and presented the H. Allen and Ann Tucker Lectureship at Michigan State University.

Peter Sutovsky was the featured mentor at the Morulae Trainee-Mentor Lunch, 44th International Embryo Technology Society (IETS) Annual Conference in Bangkok, Thailand.

Rocio Rivera was named a 2019 Fulbright Senior Scholar. Rocio will begin her Fulbright in Murcia, Spain this September.

New Faculty Grants (Total $12.1 million)


National Institutes of Health - U42. (2019-2023) “Swine somatic cell genome editing center.” PI’s KD Wells, RS Prather, Co-I TJ Safranski, JA Green, S Schommer, DY Kim, RD Schnabel.


New Graduate Student Grant

USDA AFRI NIFA Predoctoral Fellowship (2019-2021) “Investigating mTORC1 Activation Mechanisms and Its Role in the Viability of Early Porcine Embryos” Paula Chen; Faculty Mentors - RS Prather & R.D. Geisert

Faculty Invited Presentations

Matthew Lucy:

High production and high fertility: Can we have it all? British Cattle Veterinary Association Congress. 2018. Leicestershire, England.

Influence of the metabolic axis on the reproductive outcome of estrous synchronization for FTAI programs. XX Chilean Congress of Veterinary Medicine. 2018. Pinto, Chile.


Peter Sutovsky:


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Cheryl Rosenfeld: Environmental Toxicology State of the Art “Developmental Exposure to Bisphenol A or Genistein and Effects on the Gut Microbiome-Brain Axis at Adulthood”. 2019 US DOHaD.


Victoria Vieira-Potter: Let’s Talk about Sex…. Differences. The Obesity Society. 2019. Las Vegas, NV


David Patterson: Advancements in synchronization of estrus. 2019 Applied Reproductive Strategies in Beef Cattle, Knoxville, TN.

Control of estrus and ovulation in beef heifers and cows. 2019 The Society for Theriogenology, Savannah, GA.

Control of estrus and ovulation in beef heifers and cows. 2019 National Cattlemen’s Beef Association Webinar.

Expanding use of fixed-time artificial insemination in beef heifers and cows through improved strategies to manage estrus and ovulation. 2019 Midwest Section American Society of Animal Science. NC 1201 Reproduction Symposium, Omaha, NE.

Utilizing reproductive technologies: Estrus synchronization and AI. 2019 National Cattlemen’s Association Cattlemen’s College, New Orleans, LA.


St John JC, Sutovsky P. 2019. Mitochondrial DNA: Fate of the Paternal Mitochondrial Genome. eLS - Wiley Online Library


