



SSR Research Award

(Supported by the Society for the Study of Reproduction)

The SSR Research Award recognizes an active, regular member of the Society for outstanding research published during the previous six years. Criteria for the Award include the significance of problems under investigation, the breadth and depth of the analyses performed, and the level of originality manifested in the publications of this work. The recipient of the 2013 SSR Research Award is **Thomas E. Spencer, Ph.D.**

The SSR Research Award recognizes an active member of the Society who has published outstanding research in the past six years based on originality, experimental practices, leadership, and contributions to the Society. The 2013 recipient, Thomas Spencer, Ph.D., clearly meets all of these criteria. Dr. Spencer is considered an eminent reproductive biologist who has made key discoveries during the past several years that have significantly advanced our understanding of development and function of the uterus and placenta. The understanding of how the uterus develops, how the conceptus (embryo and associated extraembryonic membranes) and uterus interact to facilitate pregnancy, and the critical role of endogenous retroviruses in evolution and function of the placenta has been significantly expanded through Dr. Spencer's efforts. His research program forges links between basic biology, agriculture, and human medicine, and these discoveries have broad implications for the health of agricultural animals as well as humans. The novelty and significance of his work is best evidenced by the fact that he has been extensively funded by the USDA, NIH, and private foundations; he is currently funded by both the USDA and the NIH through 2017.

Infertility, pregnancy loss, and intrauterine growth retardation represent major problems in the reproductive performance of domestic animals and the reproductive health of women. The long-term goal of Dr. Spencer's research program is to understand the key hormonal, cellular, and molecular mechanisms regulating development and function of the uterus and

placenta and to translate these findings to the betterment of both animal and human health. His novel contributions address a variety of different disciplines, including developmental biology, retroviral biology, toxicology, and translational genomics. A few of the many significant contributions made by Dr. Spencer and his research group are highlighted below.

1. Studied the novel "uterine gland knockout" (UGKO) sheep model and more recently a mouse model to reveal that endometrial glands of the uterus are essential for domestic animals to experience normal estrous cycles and their secretions are unequivocally required for blastocyst/conceptus survival, development, and implantation during early pregnancy.
2. Used a comprehensive systems biology approach to identify key genes and pathways that discriminate between a uterus that will (normal) and will not (infertile) support conceptus survival and growth and establishment of pregnancy.
3. Demonstrated that inappropriate exposure to ovarian steroid hormones during critical windows of development is detrimental to uterine development and results in permanent defects in adult uterine function which has implications related to the consequence of exposure of infants and adults to environmental toxins that are endocrine active compounds.
4. Identified a number of genes regulated by progesterone and products of the conceptus (including interferon tau, prostaglandins, and

cortisol) that are expressed in the uterine endometrium and govern elongation and development of the ruminant conceptus.

5. Discovered expression of endogenous Jaagsiekte sheep retroviruses (enJSRVs) in the sheep uterus and placenta as well as the fetus. This research demonstrated that the enJSRVs envelope protein of this endogenous retrovirus (ERV) is essential for development of the conceptus via modulation of trophectoderm growth.

Dr. Spencer is a consummate collaborator and has readily shared his research findings with other scientists. He has published over 250 scholarly works with an h-index of 54. Many of his research publications remain some of the most highly cited papers in numerous journals. His laboratory also serves as an intellectually stimulating training ground for numerous undergraduate students, graduate students, postdoctoral fellows, and visiting scientists. Further, he has presented over 75 invited talks and worked extensively with numerous collaborators at all levels: local, national, and international.

Dr. Spencer has been the recipient of many honors for his research, including the Outstanding Young Animal Scientist Award—Research and the Animal Physiology and Endocrinology Research Award from the

American Society of Animal Science (2003 and 2013); the SSR New Investigator Award (2004); the Sigma Xi Young Investigator Award (2005); Texas AgriLIFE Research Faculty Fellow (2008); the Texas A&M University Vice Chancellor's Awards in Excellence for On-Campus Research (2005), Team Research (2005), and Diversity (2011); and the Washington State University Faculty Excellence in Research Award (2013). He served as the Chair of the Gordon Research Conference on Reproductive Tract Biology (2008), as an Associate Editor for *Biology of Reproduction* (2005–2009), and as co-Editor-in-Chief of *Biology of Reproduction* with Dr. Franco DeMayo (July 2013–June 2017). His expertise has also been recognized by being invited to serve on a number of grant review panels for NIH, NASA, and USDA extramural grants programs. Dr. Spencer served as a permanent member of the Pregnancy and Neonatology Study Section for the NIH (2009–2012) and Associate Editor for *Domestic Animal Endocrinology*; he is currently an editorial board member for *Reproduction* and *American Journal of Reproductive Immunology*. He is also a member of many scientific societies, but has been particularly active in SSR, where he was elected to serve as Director (2012–2014), and continues to ensure that the best science from his laboratory is presented annually at the SSR meeting, as well as publishing in *Biology of Reproduction*. (Submitted by Asgi Fazleabas, Ph.D.)