

Thomas Edward Spencer, Ph.D.

● Contact Information

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● Academic Background

<u>Institution</u>	<u>Degree</u>	<u>Year</u>	<u>Major</u>
Baylor College of Medicine	Postdoc	1997	Molecular and Cell Biology
Texas A&M University	Ph.D.	1995	Physiology of Reproduction
Auburn University	M.S.	1992	Animal Science
Auburn University	B.S.	1989	Animal Science

● Current Positions

2009-Present: Texas AgriLife Research Faculty Fellow and Professor of Reproductive Biology and Physiological Genomics, Department of Animal Science, Texas A&M University, College Station.

2003-present: Associate Director, Center for Animal Biotechnology and Genomics, Texas A&M University.

● Previous Positions

2009-present: Professor of Reproductive Biology and Physiological Genomics and Texas AgriLife Research Faculty Fellow and, Department of Animal Science, Texas A&M University, College Station.

2005-2009: Associate Professor, Department of Animal Science, Texas A&M University, College Station.

2006-2007: Co-Director, Environment and Reproduction Research Core, NIEHS Center for Environmental and Rural Health, Texas A&M University, College Station.

2001-2005: Assistant Professor, Department of Animal Science, Texas A&M University, College Station.

1997-2001: Research Assistant Professor, Center for Animal Biotechnology, Texas A&M Institute of Biosciences and Technology, College Station; Joint appointment as Research Assistant Professor, Department of Animal Science, Texas A&M University, College Station.

1996-1997: NIH Postdoctoral Research Fellow, Department of Cell Biology, Baylor College of Medicine, Houston, Texas. (Mentors: Drs. Bert W. O'Malley & Ming-Jer Tsai)

1994-1995: Tom Slick Graduate Research Fellow, College of Agriculture and Life Sciences, and Doctoral Candidate and Graduate Teaching Assistant, Physiology of Reproduction, Department of Animal Science, Texas A&M University, College Station. (Mentor: Dr. Fuller W. Bazer)

1992-1994: Regents' Graduate Research Fellow and Graduate Teaching Assistant, Physiology of Reproduction, Department of Animal Science, Texas A&M University, College Station. (Advisor: Dr. Fuller W. Bazer)

1989-1992: Graduate Research and Teaching Assistant in Reproductive Biology, Department of Animal and Dairy Sciences, Auburn University, Auburn, Alabama. (Mentor: Dr. Frank F. Bartol)

● Professional Organizations

American Association for the Advancement of Science

American Society of Animal Science

Endocrine Society

Sigma Xi (President-elect, 2009-2010; President TAMU Chapter, 2010-2011)

Society for the Study of Reproduction and Fertility

Society for the Study of Reproduction (Education Committee, 1999-2002; Program Committee, 2002-2004, 2008-2010; Public Affairs Committee- FASEB Science Policy Committee Representative, 2003-2006; Strategic Plan Oversight Committee, 2009-2011)

Texas Women's Reproductive Health Consortium (Steering Committee, 2003-present; Chair of Executive Committee, 2010-2013)

● Professional Activities

Faculties and Centers: Center for Animal Biotechnology and Genomics (1997-present) – Assistant Director (2001-2002) and Associate Director (2003-present); Center for Environmental and Rural Health (1998; Pilot Project Evaluation Committee, 2000-2002; Scientific Advisory Group, 2005-present); Graduate Faculty of Texas A&M University (1998-present); Faculty Coordinator: Department of Animal Science Physiology Field Laboratory, Veterinary Medical Park Swine Facility, and Nutrition Physiology Center (2001-present); Faculty of Biotechnology (2001; Curriculum Committee, 2001-2003); Faculty of Genetics (2002-present; Curriculum Committee, 2002-2005); Faculty of Reproductive Biology (1997-present; Executive Committee, 2002-present; Seminar Program Chair, 2003-2004; Chair, 2004-2006); Faculty of Toxicology (1998-present); Faculty of Animal Science (1997-present; Equipment Committee, 1999-present; Research Advisory Committee, 2005-present); Institutional Animal Care and Use Committee (Chair, Large Animal Care Committee, 2005-2006; Vice Chair, IACUC2, 2006-2008); Institutional Agricultural Animal Care and Use Committee (2000-2006; Vice Chair, 2003-2004;

Chair, 2004-2006); The Texas A&M Women's Studies Program (2002-present).

Editorial Duties: Biology of Reproduction (Associate Editor, 2005-2009); Domestic Animal Endocrinology (Associate Editor, 2009-present).

Editorial Board Membership: American Journal of Reproductive Immunology (2006-2009; 2010-2013); Biology of Reproduction (2001-2005); BMC Reproductive Biology and Endocrinology (2003-2006); Domestic Animal Endocrinology (2002-2004); Reproduction (2004-present).

Ad hoc Reviewer: American Zoologist; Anatomical Record; Biology of Reproduction; BMC Reproductive Biology and Endocrinology; BMC Genetics; Canadian Journal of Physiology and Pharmacology; Domestic Animal Endocrinology; Endocrine; Endocrinology; Experimental Cell Research; Genesis; Human Reproduction Update; In Vitro Cellular and Developmental Biology-Animal; Journal of Anatomy; Journal of Animal Science; Journal of Biological Chemistry; Journal of Clinical Endocrinology and Metabolism; Journal of Endocrinology; Journal of Molecular Endocrinology; The Journal of Nutrition; Molecular Endocrinology; Physiological Genomics; Preclinica; Reproduction; Reproduction, Fertility and Development; Trends in Endocrinology and Metabolism.

Grant Reviewer: Binational Agriculture and Research Development Grants Program (2001-2004); Genome Canada (2005); National Science and Engineering Research Council of Canada (2007); Medical Research Council, United Kingdom (2005-2008); Horsetrack Betting and Levy Board, United Kingdom (2005, 2006); NASA Developmental Biology Grants Program Panelist (2003); NIH Cellular Molecular Integrated Reproduction Study Section, Ad Hoc (2006); NIH Pregnancy and Neonatology Study Section, Ad Hoc Panelist (2005, 2007), Permanent Member (2008-present); NIH Specialized Cooperative Centers Program in Reproduction Research Study Section (2005, 2006); NIH OWRH Reviewer (2002); NSF Grants Program Reviewer (2002); The Lalor Foundation; The Wellcome Trust; USDA-National Research Initiative and Competitive Grants Program (Enhancing Animal Reproductive Efficiency 1997-2003, Panelist 2004, 2006; Animal Genomic and Genetic Mechanisms 2000-2002, Ad Hoc Reviewer).

● **Teaching**

2002-Present: Course coordinator and lecturer for graduate level courses in Reproductive Biology (ANSC 630 & ANSC 631), Department of Animal Science, Texas A&M University.

1998-2001: Lecturer in graduate level course in Physiology of Reproduction (ANSC 631), Department of Animal Science, Texas A&M University.

2000: Course coordinator and lecturer in Biotechnology Principles and Techniques (BIOT 601) for the Professional M.S. in Biotechnology Program, Texas A&M University.

● **Honors and Awards**

Lambda Sigma (1988)

Phi Kappa Phi (1989)

Gamma Sigma Delta (1989, 1995)

Cardinal Key Honor Society (1989)
American Society of Animal Science Scholarship Award (1989)
Ward Animal Science Graduate Student Scholarship Award (1990)
Auburn University Outstanding Graduate Student Award (1991)
Texas A&M Regents' Graduate Research Fellow (1992-94)
Tom Slick Graduate Research Fellow (1994-95)
Dr. A.M. "Tony" Sorenson, Jr. Achievement Award (1995)
Texas A&M University Agriculture Program Vice Chancellor's Award in Excellence for Graduate Research (1995)
NIH National Research Service Award (1996)
American Society of Animal Science (ASAS) Southern Section Outstanding Young Animal Scientist Award - Research (2003)
Animal Science Graduate Student Association Distinguished Lecturer, University of Florida (2004)
International Congress on Animal Reproduction-Young Scientist Designate from the Society for the Study of Reproduction (2004)
Meat & Livestock Australia Plenary Lecturer for the Australian Society for Reproductive Biology (2004)
Society for the Study of Reproduction New Investigator Award (2004)
Sigma Xi Young Investigator Award (2005)
Texas A&M University Agriculture Program Vice Chancellor's Award in Excellence for Research (2005)
Texas A&M University Agriculture Program Vice Chancellor's Award in Excellence for Team Research (2005)
Gordon Research Conference on Reproductive Tract Biology, Vice Chair (2006)
Texas A&M AgriLIFE Research Faculty Fellow (2008)
Gordon Research Conference on Reproductive Tract Biology, Chair (2008)
Scientific Advisory Board, Science Foundation Ireland Reproductive Biology Research Cluster, Dublin, Ireland (2008-2011)
Otto J. and Opal I. Hill Lecturer, Pennsylvania State University (2009)
6th Annual Gilbert S. Greenwald Symposium Lecturer, Kansas University Medical Center (2009)
Joy Goodwin Lecturer, Auburn University (2009)
Asdell Lecturer, Cornell University (2010)

● **Invited Talks**

1. "Role of endometrial glands in uterine function: lessons learned from the uterine gland knockout model in sheep". Havemeyer Foundation Workshop on Fetomaternal Control of Pregnancy, Barbados, West Indies. November, 1999.
2. "Lactogenic and somatogenic hormones in ovine uterine morphogenesis and function". Prolactin Gordon Research Conference, Ventura, California. February, 2000.
3. "Endometrial gland morphogenesis and function in the mammalian uterus: lessons learned from the ovine uterine gland knockout model". Gordon Research Conference on Reproductive Tract Biology, New London, Connecticut. July, 2000.
4. "Developmental biology and role of endometrial glands in uterine function". Gordon Research Conference on Reproductive Tract Biology, New London, Connecticut. July, 2002.
5. "Uterine Development: Regulatory Mechanisms and Their Impact on Fertility".

- Women's Health Research Symposium, Texas A&M University, College Station. April 22, 2003.
6. "Developmental biology and role of endometrial glands in uterine function". Havemeyer Foundation Workshop on Embryonic and Fetal Nutrition, Ravello, Italy. May, 2003.
 7. "Uterine and placental factors regulating conceptus growth in domestic animals". Triennial Symposium on Reproductive Biology, American Society of Animal Science/American Dairy Science Association, Phoenix, Arizona. June, 2003.
 8. "Biology of Progesterone and Placental Hormone Actions on the Uterus". Mini-symposium on Steroids and Uterine Function, 36th Annual Meeting of the Society for the Study of Reproduction, Cincinnati, Ohio. July, 2003.
 9. "Developmental Biology and Function of Uterine Glands". MO-KAN Reproductive Biology Symposium, Kansas City, MO. November, 2003.
 10. "Discovery of uterine genes regulating conceptus survival and growth using the uterine gland knockout (UGKO) sheep model". Cattle/Sheep Workshop, Plant and Animal Genome XII, San Diego, CA. January, 2004.
 11. "Lactogenic Hormones and Uterine Function". Gordon Conference on the Prolactin Family, Ventura, California. February, 2004.
 12. "Hormonal, Cellular, and Molecular Regulation of Uterine Development and Function: Insights from the Ewe." Trans-Atlantic Exchange Lectures, 37th Annual Meeting of the Society for the Study of Reproduction, Vancouver, British Columbia, Canada. August, 2004.
 13. "Conceptus signals for establishment and maintenance of pregnancy". 15th International Congress on Animal Reproduction (ICAR), Porto Seguro Brazil. August, 2004.
 14. "Uterine and placental factors regulating conceptus growth: insights from the ewe". Meat & Livestock Australia Plenary Lecturer, Annual Meeting of the Society for Reproductive Biology of Australia, Sydney. August, 2004.
 15. "Biology of viruses and crystals in the uterus and placenta: insights from the ewe". Animal Science Graduate Student Association Distinguished Lecture, University of Florida, Gainesville. November, 2004.
 16. "Progesterone regulation of uterine function and conceptus growth: genes and conundrums". University of Nottingham, Sutton Bonington Campus, England. April, 2005.
 17. "Endogenous betaretroviruses in sheep: biological roles in uterine function, conceptus growth, and placental differentiation". Institute of Comparative Medicine, University of Glasgow Veterinary School, Glasgow, Scotland. April, 2005.
 18. "Programming of neonatal and adult uterine development and function by hormones: impacts on conceptus survival and development". New Investigator Exchange Lecturer, Fertility 2005, Warwick University, Coventry, England. April, 2005.
 19. "Endogenous betaretroviruses of sheep: biological roles in uterine function and placental morphogenesis". Mini-Symposium X. Endogenous Retroviruses and Reproduction, Annual Meeting of the Society for the Study of Reproduction, Quebec City, Canada. July, 2005.
 20. "Comparative biology as a key to understanding uterine development and function." Young Investigator Award Lecture, Annual Meeting of the Sigma Xi Society, Seattle,

- Washington. November, 2005.
21. "Progesterone regulation of peri-implantation conceptus development: genes and conundrums". Havemeyer Foundation Workshop on Embryonic and Fetal Nutrition, Ravello, Italy. May, 2006.
 22. "Endogenous retroviruses in the female reproductive tract: potential roles in placental morphogenesis and mucosal immunity". Annual Meeting of the American Society for Reproductive Immunology, Nashville, Tennessee. June, 2006.
 23. "Developmental biology and functional role of endometrial glands in the uterus". Gordon Research Conference on Reproductive Tract Biology, New London, Connecticut. June, 2006.
 24. "Fetal-maternal interactions during the establishment of pregnancy in ruminants". 7th International Ruminant Reproduction Symposium, Wellington, New Zealand. August, 2006.
 25. "Postnatal uterine development in the ewe: role of prolactin and the ovary". AgResearch, Invermay, New Zealand. August, 2006.
 26. "Endogenous retroviruses regulate peri-implantation conceptus growth and differentiation". Workshop on Endogenous Retrovirus and Retroelements, Mystic, CT. September, 2006.
 27. "Progesterone and Interferon Tau Regulation of Blastocyst Development in Ruminants". Department of Animal Science, The Ohio State University, Columbus, OH. September 21, 2006.
 28. "Endogenous Retroviruses: Essential Regulators of Placental Development". Ohio Agricultural Research and Development Center, The Ohio State University, Wooster, OH. September 22, 2006.
 29. "Pregnancy Recognition and Conceptus Implantation in Domestic Ruminants: Roles of Progesterone, Interferons and Endogenous Retroviruses". International Embryo Transfer Society 33rd Annual Conference, Kyoto, Japan. January, 2007.
 30. "Hormonal Regulation of Endometrial Function and Conceptus Development: Insights from the Sheep". Iwate University, Morioka, Japan. January, 2007.
 31. "Endocrine Disruption of Neonatal Uterine Development Compromises Pregnancy". Sigma Xi and Center for Environmental and Rural Health Spring 2007 Symposium, Texas A&M University. March 29, 2007.
 32. "Endogenous Retroviruses: Essential Regulators of Placental Development?". Center for Virus Research, University of California, Irvine. April, 2007.
 33. "Regulatory Mechanisms Governing Blastocyst Elongation and Development in Ruminants". Conaway Institute, University College of Dublin, Ireland. June, 2007.
 34. "Biological Functions of Galectin-15 in the Ovine Uterus". CSREES USDA National Research Initiative Animal Reproduction Annual Investigator Meeting, San Antonio, Texas. August, 2007.
 35. "Pregnancy Recognition Signaling by Interferon Tau". Keynote Speaker, European Society for Domestic Animal Reproduction, Hanover, Germany. September, 2007.
 36. "Pathways Regulating Conceptus-Endometrial Interactions: Insights from the Sheep". Second International Meeting on Mammalian Embryogenomics, Paris, France. October, 2007.

37. “Overview of Embryo-Maternal Interactions: Novel Insights and Critical Events for Pregnancy Success”. 1st World Congress on Reproductive Biology, Kona, Hawaii. May, 2008.
38. “Genes and Pathways Regulating Implantation: Comparative Insights from the Sheep”. Society for the Study of Reproduction, Annual Meeting, Kona, Hawaii. May, 2008.
39. “Biological Functions of Galectin-15 in the Ovine Uterus”. CSREES USDA National Research Initiative Animal Reproduction Annual Investigator Meeting, Indianapolis, Indiana. July, 2008.
40. “Maternal Interactions with Gametes and Embryos”. EU COST GEMINI Meeting, Volos, Greece. October, 2008.
41. “Conceptus-endometrial Interactions in Ruminants”. 6th International Congress on Farm Animal Endocrinology, Roanoke, Virginia. November, 2008.
42. “Postnatal Uterine Development: Strategies and Insights from Domestic Animals”. Keystone Symposium, Frontiers in Reproductive Biology and Regulation of Fertility, Santa Fe, New Mexico. February, 2009.
43. “Endogenous Retroviruses: From Infectious Elements to Essential Genes”. Otto J. and Opal I. Hill Lecturer, The Pennsylvania State University, University Park. April 9, 2009.
44. “Conceptus-Uterine Interactions: New Insights from Sheep”. Dairy and Animal Science Department, The Pennsylvania State University, University Park. April 10, 2009.
45. “Implantation in Domestic Animals: Mechanisms and Insights”. 2nd International (French-Polish) Symposium on Endocrinology and Reproduction, Krakow, Poland. April 23-25, 2009.
46. “Retroviruses and Pre-implantation Development: Insights from Sheep”. Trophoblast Research Day, Centre for Trophoblast Research, Cambridge University, England. July 13-14, 2009.
47. “Endogenous Retroviruses: From Infectious Elements to Essential Genes”. 6th Annual Gilbert S. Greenwald Reproductive Biology Symposium, Kansas City, Kansas. October 9, 2009.
48. “Conceptus-Maternal Interactions: Problems, Insights and Possible Solutions”. The Joy Goodwin Lecture, College of Veterinary Medicine, Auburn University, Alabama. November 6, 2009.
49. “The Role of Wnt Signaling in Conceptus-Endometrial Interactions”. 57th Annual Meeting of the Society for Gynecologic Investigation, Orlando, Florida. March 25, 2010.
50. “Endogenous Retroviruses: From Infectious Elements to Essential Genes”. Asdell Lecturer, Department of Animal Science, Cornell University. April 7, 2010.
51. “Comparative Aspects of Conceptus-Endometrial Interactions and Implantation”. Frontiers in Periimplantation Biology Symposia of the First State Key Laboratory of Reproductive Biology, Beijing, China. May 8-12, 2010.
52. “Endogenous Retroviruses: From Infectious Elements to Essential Genes”. WCU Biomodulation Major Symposium, Seoul National University, Korea. May 14, 2010.
53. “Maternal Nutrition and Programming of Fetal Development”. Alltech Distinguished Lecturer, University of Kentucky, Lexington. July 1, 2010.

● **Papers in Refereed Scientific Journals:**

1. Spencer TE, Bartol FF, Wiley AA, Coleman DA. Lectin binding sites as markers of neonatal porcine uterine development. *J Histochem Cytochem* 1992; 40:1937-1942.
2. Spencer TE, Bartol FF, Wiley AA, Coleman DA, Wolfe DF. Neonatal porcine endometrial development involves coordinated changes in DNA synthesis, glycosaminoglycan distribution, and ³H-glucosamine labeling. *Biol Reprod* 1993; 48:729-740.
3. Spencer TE, Wiley AA, Bartol FF. Neonatal age and period of estrogen exposure affect uterine growth, morphogenesis and protein synthesis. *Biol Reprod* 1993; 48:741-751.
4. Wolfenson D, Bartol FF, Badinga L, Barros CM, Marple DN, Cummins K, Wolfe D, Lucy MC, Spencer TE, Thatcher WW. Secretion of PGF_{2α} and oxytocin during hyperthermia in cyclic and pregnant heifers. *Theriogenology* 1993; 39:1129-1142.
5. Bartol FF, Johnson LL, Floyd JG, Wiley AA, Spencer TE, Buxton DF, Coleman DA. Neonatal exposure to progesterone and estrogen alters uterine morphology and luminal protein content in adult beef heifers. *Theriogenology* 1995; 43:835-844.
6. Kelley RL, Jungst SB, Spencer TE, Owsley WF, Rahe CH, Mulvaney DR. Maternal treatment with somatotropin alters embryonic development and early postnatal growth of pigs. *Dom Anim Endocrinol* 1995; 12:83-94.
7. Spencer TE, Graf GA, Bazer FW. Sulfated glycoprotein one (SGP-1) expression in ovine endometrium during the estrous cycle and early pregnancy. *Reprod Fertil Develop* 1995; 7:1053-1060.
8. Spencer TE, Ing, NH, Ott TL, Mayes JS, Becker WC, Watson GH, Miranda MA, Bazer FW. Intrauterine injection of ovine interferon-tau alters oestrogen receptor and oxytocin receptor expression in the endometrium of cyclic ewes. *J Mol Endo* 1995; 15:203-220.
9. Spencer TE, Becker WC, George P, Miranda MA, Ogle TF, Bazer FW. Ovine interferon-tau regulates expression of endometrial receptors for estrogen and oxytocin, but not progesterone. *Biol Reprod* 1995; 53:732-745.
10. Spencer TE, Miranda MA, Ogle TF, Bazer FW. Ovine interferon-tau inhibits estrogen receptor up-regulation and estrogen-induced luteolysis in ewes. *Endocrinology* 1995; 136:4932-4944.
11. Spencer TE, Bazer FW. Temporal and spatial regulation of uterine receptors for estrogen and progesterone during the estrous cycle and early pregnancy in ewes. *Biol Reprod* 1995; 53:1527-1544.
12. Ing NH, Spencer TE, Bazer FW. Estrogen enhances endometrial estrogen receptor gene expression by a post-transcriptional mechanism in the ovariectomized ewe. *Biol Reprod* 1996; 54:591-599.
13. Spencer TE, Bazer FW. Ovine interferon-tau suppresses transcription of the estrogen receptor and oxytocin receptor genes in ovine endometrium. *Endocrinology* 1996; 137:1144-1147.
14. Spencer TE, Miranda MA, Watson GH, Ott TL, Bazer FW. Effects of interferon-tau and progesterone on estrogen-stimulated expression of receptors for estrogen, progesterone and oxytocin in the endometrium of ovariectomized ewes. *Reprod Fertil Develop* 1996; 8:843-853.
15. Christenson RK, Bartol FF, Vallet JL, Wiley AA, Spencer TE. Comparative study of

- uterine morphogenesis and protein secretion in neonatal Meishan and white crossbred pigs. *Biol Reprod* 1997; 56:1112-1119.
16. Jenster G, Spencer TE, Burcin MM, Tsai SY, Tsai M-J, O'Malley BW. Steroid receptor induction of gene transcription: a two-step model. *Proc Natl Acad Sci USA* 1997; 94:7879-7884.
 17. Ott TL, Fleming JG, Spencer TE, Joyce MM, Chen P, Green CNK, Zhu D, Welsh TH Jr, Harms PG, Bazer FW. Effects of exogenous recombinant ovine interferon tau on circulating concentrations of progesterone, cortisol, LH and antiviral activity, interestrous interval, rectal temperature, and uterine response to oxytocin in cyclic ewes. *Biol Reprod* 1997; 57:621-629.
 18. Spencer TE, Jenster G, Burcin M, McKenna N, Allis CD, Zhou J, Onate S, Tsai SY, Tsai M-J, O'Malley BW. Steroid receptor coactivator one (SRC-1) is a histone acetyltransferase. *Nature* 1997; 389:194-196.
 19. Onate SA, Boonyaratanakornkit V, Spencer TE, Tsai SY, Tsai M-J, Edwards DP, O'Malley BW. Steroid receptor coactivator-one contains multiple receptor interacting and activation domains that cooperatively enhance the activation function 1 (AF1) and AF2 domains of the steroid receptors. *J Biol Chem* 1998; 273:12101-12108.
 20. Ott TL, Spencer TE, Lin JY, Kim H-T, Gerami B, Bartol FF, Wiley AA, Bazer FW. 1998. Effects of the estrous cycle and early pregnancy on uterine expression of Mx protein in sheep (*Ovis aries*). *Biol Reprod* 1998; 59: 784-794.
 21. Spencer TE, Ott TL, Bazer FW. Expression of interferon regulatory factors one (IRF-1) and two (IRF-2) in the ovine endometrium: effects of pregnancy and interferon tau. *Biol Reprod* 1998; 58:1154-1162.
 22. Tarleton BJ, Wiley AA, Spencer TE, Moss AG, Bartol FF. Ovary-independent estrogen receptor expression in the neonatal porcine uterus. *Biol Reprod* 1998; 58:1009-1019.
 23. Johnson GA, Spencer TE, Hansen TR, Austin KJ, Burghardt RC, Bazer FW. Expression of the interferon tau inducible ubiquitin cross-reactive protein in the ovine uterus. *Biol Reprod* 1999; 61:312-318.
 24. Johnson GA, Spencer TE, Burghardt RC, Bazer FW. Ovine osteopontin: I. Cloning and expression of mRNA in the uterus during the peri-implantation period. *Biol Reprod* 1999; 61:884-891.
 25. Johnson GA, Burghardt RC, Spencer TE, Newton GR, Ott TL, Bazer FW. Ovine osteopontin: II. Osteopontin and $\alpha_v\beta_3$ integrin expression in the uterus and conceptus during the peri-implantation period. *Biol Reprod* 1999; 61:892-899.
 26. Johnson GA, Burghardt RC, Taylor KM, Fleming JGW, Bazer FW, Spencer TE. Development and characterization of immortalized ovine endometrial cell lines. *Biol Reprod* 1999; 61:1324-1330.
 27. Spencer TE, Bartol FF, Bazer FW, Johnson GA, Joyce MM. Identification and characterization of glycosylation dependent cell adhesion molecule 1 (GlyCAM-1) expression in the ovine uterus. *Biol Reprod* 1999; 60: 241-250.
 28. Spencer TE, Gray CA, Ott TL, Johnson GA, Ramsey WS, Bazer FW. Differential effects of intrauterine and subcutaneous administration of recombinant ovine interferon tau on endometrial gene expression of cyclic ewes. *Biol Reprod* 1999; 61:464-470.
 29. Spencer TE, Gray CA, Joyce MM, Jenster G, Wood CG, Bazer FW, Wiley AA, Bartol

- FF. Discovery and characterization of genes expressed in the endometrial epithelium using the ovine uterine gland knockout model. *Endocrinology* 1999; 140:4070-4080.
30. Spencer TE, Stagg AG, Taylor KM, Johnson GA, Gertler A, Gootwine E, Bazer FW. Effects of recombinant ovine interferon tau, placental lactogen and growth hormone on ovine endometrial function. *Biol Reprod* 1999; 61:1409-1418.
 31. Chen C, Spencer TE, Bazer FW. Fibroblast growth factor-10: A stromal mediator of epithelial function in the ovine uterus. *Biol Reprod* 2000; 63:959-966.
 32. Chen C, Spencer TE, Bazer FW. Expression of hepatocyte growth factor and its receptor c-met in the ovine uterus. *Biol Reprod* 2000; 62:1844-1850.
 33. Gray CA, Bartol FF, Taylor KM, Wiley AA, Ramsey WS, Ott TL, Bazer FW, Spencer TE. The ovine uterine gland knockout model: effects of gland ablation on the estrous cycle. *Biol Reprod* 2000; 62:448-456.
 34. Gray CA, Taylor KM, Bazer FW, Spencer TE. Mechanisms regulating 19-norprogesterone inhibition of endometrial gland morphogenesis in the neonatal ovine uterus. *Mol Reprod Dev* 2000; 57:67-78.
 35. Hill JR, Burghardt RC, Jones K, Long CR, Looney CR, Prior J, Shin T-Y, Spencer TE, Thompson JA, Winger QA, Westhusin ME. Evidence for placental abnormality as the major cause of mortality in first-trimester somatic cell cloned bovine fetuses. *Biol Reprod* 2000; 63:1787-1794.
 36. Johnson GA, Spencer TE, Burghardt RC, Joyce MM, Bazer FW. Interferon-tau and progesterone regulate ubiquitin cross-reactive protein expression in the ovine uterus. *Biol Reprod* 2000; 62:622-627.
 37. Johnson GA, Spencer TE, Burghardt RC, Taylor KM, Gray CA, Bazer FW. Progesterone modulation of osteopontin gene expression in the ovine uterus. *Biol Reprod* 2000; 62:1315-1321.
 38. Palmarini M, Hallwirth C, York D, Murgia C, de Olivera T, Spencer TE, Hung F. Molecular cloning and functional analysis of three type D endogenous retroviruses of sheep reveal a different cell tropism from that of the highly related exogenous sheep retrovirus. *J Virol* 2000; 74:8065-8076.
 39. Ka H, Spencer TE, Johnson GA, Bazer FW. Keratinocyte growth factor: expression by endometrial epithelia of the porcine uterus. *Biol Reprod* 2000; 62:1772-1778.
 40. Stewart MD, Johnson GA, Burghardt RC, Schuler LA, Joyce MM, Bazer FW, Spencer TE. Prolactin receptor and uterine milk protein expression in the ovine uterus. *Biol Reprod* 2000; 62:1779-1789.
 41. Taylor KM, Gray CA, Stewart MD, Joyce MM, Bazer FW, Spencer TE. Neonatal ovine uterine gland development involves alterations in expression of receptors for progesterone, prolactin and estrogen. *Biol Reprod* 2000; 63:1192-1204.
 42. Wang G, Johnson GA, Spencer TE, Bazer FW. Isolation, immortalization, and initial characterization of uterine cell lines: an in vitro model system for the porcine uterus. *In Vitro Cell Dev Biol Anim* 2000; 36:650-656.
 43. Asselin E, Johnson GA, Spencer TE, Bazer FW. Expression of monocyte chemotactic protein-1 and -2 in the ovine uterus: regulation by pregnancy, progesterone and interferon- τ . *Biol Reprod* 2001; 64:992-1000.
 44. Choi Y, Johnson GA, Burghardt RC, Berghman LR, Joyce MM, Taylor KM, Stewart

- MD, Bazer FW, Spencer TE. Interferon regulatory factor two restricts expression of interferon-stimulated genes to the endometrial stroma and glandular epithelium of the ovine uterus. *Biol Reprod* 2001; 65:1038-1049.
45. Fleming JGW, Choi YS, Bazer FW, Johnson GA, Spencer TE. Cloning of the ovine estrogen receptor alpha promoter and functional regulation by ovine interferon tau. *Endocrinology* 2001; 142:2879-2887.
 46. Gray CA, Bazer FW, Spencer TE. Effects of neonatal progestin exposure on female reproductive tract structure and function in the adult ewe. *Biol Reprod* 2001; 64:797-804.
 47. Gray CA, Taylor KM, Ramsey WS, Hill JR, Bazer FW, Bartol FF, Spencer TE. Endometrial glands are required for pre-implantation conceptus elongation and survival. *Biol Reprod* 2001; 64:1608-1613.
 48. Johnson GA, Gray CA, Stewart MD, Choi Y, Gray CA, Burghardt RC, Yu-Lee L-y, Chebath J, Bazer FW, Spencer TE. Effects of the estrous cycle, pregnancy and interferon tau on 2',5'-oligoadenylate synthetase expression in the ovine uterus. *Biol Reprod* 2001; 64:1392-1399.
 49. Johnson GA, Ying G-y, Spencer TE, Bazer FW. Isolation, immortalization and initial characterization of uterine cell lines: an in vitro model system for the porcine uterus. *In Vitro Cell Dev Biol* 2001; 36:650-656.
 50. Johnson GA, Bazer FW, Jaeger LA, Ka H, Garlow JE, Pfarrer C, Spencer TE, Burghardt RC. Muc-1, integrins and osteopontin during the implantation cascade in sheep. *Biol Reprod* 2001; 65:820-828.
 51. Ka H, Jaeger LA, Johnson GA, Spencer TE, Bazer FW. Keratinocyte growth factor is up-regulated by estrogen in the porcine uterine endometrium and functions in trophoblastic cell proliferation and differentiation. *Endocrinology* 2001; 143:2303-2310.
 52. Palmarini MA, Gray CA, Carpenter K, Fan H, Bazer FW, Spencer TE. Expression of endogenous betaretroviruses in the ovine uterus: effects of neonatal age, estrous cycle, pregnancy, and progesterone. *J Virol* 2001; 75:11319-11327.
 53. Stewart D, Johnson GA, Vyhlidal CA, Burghardt RC, Safe SH, Yu-Lee L-y, Bazer FW, Spencer TE. Interferon tau activates multiple STAT proteins and has complex effects on interferon-responsive gene transcription in ovine endometrial epithelial cells. *Endocrinology* 2001; 142:98-107.
 54. Stewart MD, Johnson GA, Bazer FW, Spencer TE. Interferon tau (IFN τ) regulation of IFN-stimulated gene expression in cell lines lacking specific IFN-signaling components. *Endocrinology* 2001; 142:1786-1794.
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● Invited Review Papers and Book Chapters

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● **Grants and Contracts**

Current

“Endogenous Retroviruses and Placental Morphogenesis”

Principal Investigator: Thomas E. Spencer; Co-PI: Massimo Palmarini

Agency: NIH-NICHD

Type: 1 R01 HD052745

Period: 04/26/2007-02/29/2012

“Genetic Regulation of Postnatal Uterine Morphogenesis and Function”

Principal Investigator: Thomas E. Spencer

Agency: NIH-NICHD

Type: 1 R21 HD54679

Period: 07/01/2007-06/30/2010

“Physiological Roles of Prostaglandins and Interferon Tau in Conceptus Development and Endometrial Function”

Principal Investigator: Thomas E. Spencer; Co-I: Fuller W. Bazer & Robert C. Burghardt

Agency: USDA CSREES

Type: AFRI 2009-01722

Period: 09/01/2009-08/31/2012

“Regulatory mechanisms of chicken microRNAs in avian influenza virus replication”

Principal Investigator: Huaijun Zhou; Co-investigators: Blanca Lupiani & Thomas E. Spencer

Agency: USDA

Type: Formula Animal Health (1433)

Period: 2010-2012

Amount: \$40,000 total

Completed

“Biological Functions of Galectin-15 in the Ovine Uterus”

Principal Investigators: Thomas E. Spencer & Robert C. Burghardt

Agency: USDA

Type: NRICGP 2005-01476

Period: 09/01/2005 – 08/31/2009

“Ovine Interferon-Tau Regulates Uterine Hormone Receptors”

Principal Investigator: Fuller W. Bazer; Co-I: Thomas E. Spencer

Agency: NIH-NICHD

Type: 2 R01 HD32534

Period: 02/28/2001-02/27/2008

“Mechanisms Regulating Uterine Morphogenesis”

Principal Investigator: Thomas E. Spencer

Agency: NIH-NICHD
Type: R01
Grant Number: 1R01 HD38274
Period: 04/01/2001-03/31/2006

“Role of Endometrial Glands in Uterine Function”

Principal Investigator: Thomas E. Spencer
Agency: USDA
Type: NRICGP 2001-02259
Period: 09/01/2001-08/31/2005

“Placental Lactogen Enhances Production Efficiency in Sheep”

Principal Investigators: Thomas E. Spencer, Fuller W. Bazer (USA); Elisha Gootwine and Arieh Gertler (Israel)
Agency: Binational Agriculture Research and Development Fund (BARD)
Grant Number: US-3199-OCR
Period: 09/01/2001-08/31/2005

“Role of Endometrial Glands in Uterine Function”

Principal Investigator: Thomas E. Spencer
Agency: USDA
Type: NRICGP 98-35203-6322
Period: 09/01/1998-8/31/2002

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