

Publications

Peer-Reviewed

- 1) Siqueira LC, dos Santos JT, Ferreira R, dos Santos RA, dos Reis AM, Oliveira JF, Fortune JE, and Goncalves PB. 2012 Preovulatory changes in the angiotensin II system in bovine follicles. *Reproduction Fertility and Development* 25:539-546
- 2) Fortune JE, Yang MY, Allen JJ, and Herrick SL. 2013, The ovarian follicular reserve in cattle: What regulates its formation and size? *J Anim Sci* 91-3041-3050
- 3) Ganchou, F.P., E.K. Inskeep, J.A. Flores 2012. Role of endothelin 1 in steroid production by ovine granulosa cells collected from large preovulatory follicles. *Revista Científica, FCV-LUZ* 22:103-111.
- 4) Ganchou, F. P., J. E. Mankey, M. P.Goravanahally, E. K. Inskeep and J. A. Flores. 2012. Effect of chronic administration of endothelin receptor type a antagonist (bq-610) on functional lifespan of the corpus luteum in sheep. *Revista Científica, FCV-LUZ* 22:321–331.
- 5) Knights, M., Siew, N., Ramgattie, R., Singh-Knights, D and Bourne, G. (2012). Effect of time of weaning on reproductive performance of ewes and growth of lambs in barbados blackbelly sheep reared under a tropical photoperiod. *Small Ruminant Research* 103:205-210.
- 6) Mani, V., Harris, A.J., Keating, A.F., Weber, T.E. Dekkers, J.C.M., and Gabler. N.K. 2013. Intestinal integrity, endotoxin transport and detoxification in pigs divergently selected for residual feed intake. *Journal of Animal Science*. 91(5):2141-50.
- 7) Nickelson, K.J., Stromsdorfer, K.L., Pickering, R.T., Liu, T.W., Ortinau, L.C., Keating, A.F., and Perfield, J.W. A comparison of inflammatory and oxidative stress markers in adipose tissue from weight-matched obese male and female mice. *Experimental Diabetes Research*. *In Press*.
- 8) Bhattacharya, P., Madden, J.A., Sen, N., Hoyer, P.B., and Keating, A.F. 2013. Glutathione S-transferase class mu regulation of apoptosis signal-related kinase 1 protein during VCD-induced ovotoxicity in neonatal rat ovaries. *Toxicology and Applied Pharmacology*. 267(1):49-56.
- 9) Oliveira RV, Dogan S, Belser LE, Kaya A, Topper E, Moura A, Thibaudeau G, Memili E. (2013) Molecular Morphology and Function of Bull Spermatozoa Linked to Histones and Associated with Fertility. *Journal of Reproduction-In press*.
- 10) Dogan S, Mason M, Govindaraju A, Belser EL, Kaya A, Stokes J, Rowe D, Memili E. Interrelationships between apoptosis and male fertility. (2013) *Journal of Reproduction and Development*. PMID: 22986927
- 11) Govindaraju A, Robertson L, Atli O, Kaya A, Topper E, Uzun A, Padbury J, Memili E. Dynamics of microRNAs in bull spermatozoa. (2012) *Reprod Biol Endocrinol*. 10(1):82. PMID:22978562
- 12) Govindaraju A, Dogan S, Rodriguez-Osorio N, Grant K, Kaya A, Memili E. Delivering value from sperm proteomics for fertility. (2012) *Journal of Cell and Tissue Research* 349(3):783-93. PMID: 22688957
- 13) Rodriguez-Osorio N, Urrego R, Cibelli JB, Eilertsen K, Memili E. Reprogramming Mammalian Somatic Cell. (2012) *Theriogenology* S0093-691X(12)00322-6. doi: 10.1016/j.theriogenology.2012.05.030. PMID: 22979962
- 14) Wang H, Camargo OD and Memili E. Mycotoxin Alpha-Zearalenol Impairs the Quality of Preimplantation Porcine Embryos in vitro. (2012) *Journal of Reproduction and Development*. 58(3):338-43.
- 15) Tian X and Diaz FJ. Zinc depletion causes multiple defects in ovarian function during the periovulatory period. *Endocrinology*: (2012) 153:873-886.

- 16) Tian X and Diaz FJ. Acute dietary zinc deficiency before conception compromises oocyte epigenetic programming and disrupts embryonic development. *Developmental Biology* (2013) 376(1):51-61.
- 17) Lisle RS, Anthony K, Randall M and Diaz FJ. Oocyte-cumulus cell interactions regulate free intracellular zinc in mouse oocytes. *Reproduction* (2013) 145: 381-390.
- 18) Brown, D.E., Dechow, C.D., Liu, W.S., Harvatine, K.J., Ott, T.L. (2012). Hot topic: Association of telomere length with age, herd, and culling in lactating Holsteins. *Journal of Dairy Science* 95: 1-4.
- 19) Bridges, G.A., Mussard, M.L., Pate, J.L., Ott, T.L., Hansen, T.R., Day, M.L. (2012). Impact of preovulatory estradiol concentrations on conceptus development and uterine gene expression. *Animal Reproduction Science* 133: 16-26.
- 20) Macrina, A.L., Ott, T.L., Roberts, R.F., Kensinger, R.S. (2012). Estrone and estrone sulfate concentrations in milk and milk fractions. *Journal of the Academy of Nutrition and Dietetics*. 112:1088-1093.
- 21) Racicot, K., Schmitt, A., Ott, T.L. (2012). The myxovirus-resistance protein, MX1, is a component of exosomes secreted by uterine epithelial cells. *American Journal of Reproductive Immunology*. 67(6): 498-505.
- 22) Bridges, GA, Mussard, ML, Pate, JL, Ott, TL, Hansen, TR, Day, ML. 2012. Impact of preovulatory estradiol concentrations on conceptus development and uterine gene expressions. *Anim. Reprod. Sci.* 133: 16-26.
- 23) Ndiaye, K, Poole, DH, Walusimbi, S, Cannon, MJ, Toyokawa, K, Maalouf, SW, Dong, J, Thomas P, Pate, JL. 2012. Progesterone effects on lymphocytes may be mediated by membrane progesterone receptors. *J. Reprod. Immunol.* 95:15-26.
- 24) Pate, JL, Johnson-Larson, CJ, Ottobre, J.S. 2012. Life or death decisions in the corpus luteum. *Reprod. Dom. Anim.* 47 (Suppl. 4), 297-303.
- 25) Walusimbi, SS, Pate, JL. 2013. The role of immune cells in the corpus luteum. *J. Anim. Sci.* 91:1650-1659.
- 26) Duncan A, Forcina JJ, Birt AN, Townson DH 2012 Estrous cycle-dependent changes of Fas expression in the bovine corpus luteum: Influence of keratin 8/18 intermediate filaments and cytokines. *Reproductive Biology and Endocrinology* 10:90
- 27) Mack EM, Smith JE, Kurz SG, and Wood JR (2012) Cyclic AMP dependent regulation of ovulatory response genes is amplified by IGF1 due to synergistic effects on Akt phosphorylation and NF- κ B transcription factors, *Reproduction* 144(5): 595-602, PMID: 22956516
- 28) Tart JK, Johnson RK, Bundy JW, Ferdinand NN, McKnite AM, Wood JR, Miller PS, Rothschild MF, Spangler ML, Garrick DJ, Kachman SD, and Ciobanu DC (2013) Genome-wide prediction of age at puberty and reproductive longevity in sows, *Animal Genetics* (in press), PMID: 23437861
- 29) Ko, C., R. Meidan and P.J. Bridges. 2012. Why two endothelins and two receptors for ovulation and luteal regression? *Life Sciences*. 91:501-506.
- 30) Wiltbank, M. C., A. H. Souza, J. O. Giordano, A. B. Nascimento, J. M. Vasconcelos, M. H. C. Pereira, P. M. Fricke, R. S. Surjus, F. C. S. Zinsly, P. D. Carvalho, R. W. Bender, and R. Sartori. 2012. Positive and negative effects of progesterone during timed AI protocols in lactating dairy cattle. *Animal Reproduction* 2012 9:231-241.
- 31) Nascimento AB, Souza AH, Guenther JN, Costa FP, Sartori R, Wiltbank MC. Effects of treatment with human chorionic gonadotrophin or intravaginal progesterone-releasing device after AI on

- circulating progesterone concentrations in lactating dairy cows. *Reproduction Fertility and Development* 2012 published online Oct 12, 2012.
- 32) Herlihy MM, Giordano JO, Souza AH, Ayres H, Ferreira RM, Keskin A, Nascimento AB, Guenther JN, Gaska JM, Kacuba SJ, Crowe MA, Butler ST, Wiltbank MC. Presynchronization with Double-Ovsynch improves fertility at first postpartum artificial insemination in lactating dairy cows. *J Dairy Sci.* 2012 Dec;95(12):7003-14. Epub 2012 Sep 26.
 - 33) Bridges, P.J., M. Jeoung, S. Shim, J. Park, J. Lee, L.A. Sapsford, K. Trudgen, C. Ko, M.C. Gye and M. Jo. 2012. Hematopoietic prostaglandin D synthase: an ESR1-dependent oviductal epithelial cell synthase. *Endocrinology.* 153:1925-1935.
 - 34) Weems, Y.S., P.J. Bridges, M. Jeoung, J. Arreguin-Arevalo, T.M. Nett, R.C. Vann, S.P. Ford, A.W. Lewis, D.A. Neuendorff, T.A. Welsh, R.D. Randel and C.W. Weems. 2012. In vivo intra-luteal implants of prostaglandin (PG) E₁ or E₂ (PGE₁, PGE₂) prevent luteolysis in cows. II. mRNA for PGF_{2α}, EP1, EP2, EP3(A-D), EP3A, EP3B, EP3C, EP3D, and EP4 prostanoid receptors in luteal tissue. *Prostaglandins and Other Lipid Mediators.* 97:60-65.
 - 35) Giordano JO, Wiltbank MC, Guenther JN, Ares MS, Lopes G Jr, Herlihy MM, Fricke PM. Effect of presynchronization with human chorionic gonadotropin or gonadotropin-releasing hormone 7 days before resynchronization of ovulation on fertility in lactating dairy cows. *J Dairy Sci.* 2012 Oct;95(10):5612-25.
 - 36) Giordano JO, Fricke PM, Guenther JN, Lopes G Jr, Herlihy MM, Nascimento AB, Wiltbank MC. Effect of progesterone on magnitude of the luteinizing hormone surge induced by two different doses of gonadotropin-releasing hormone in lactating dairy cows. *J Dairy Sci.* 2012 Jul;95(7):3781-93. doi: 10.3168/jds.2011-5155.
 - 37) Giordano JO, Wiltbank MC, Fricke PM. Humoral immune response in lactating dairy cows after repeated exposure to human chorionic gonadotropin. *Theriogenology.* 2012 Jul 1;78(1):218-24. Epub 2012 Apr 10.
 - 38) Driver AM, Peñagaricano F, Huang W, Ahmad KR, Hackbart KS, Wiltbank MC, Khatib H. RNA-Seq analysis uncovers transcriptomic variations between morphologically similar in vivo- and in vitro-derived bovine blastocysts. *BMC Genomics.* 2012 Mar 28;13:118.
 - 39) Wiltbank MC, Souza AH, Carvalho PD, Bender RW, Nascimento AB. Improving fertility to timed artificial insemination by manipulation of circulating progesterone concentrations in lactating dairy cattle. *Reprod Fertil Dev.* 2012;24(1):238-43.
 - 40) Giordano JO, Wiltbank MC, Guenther JN, Pawlisch R, Bas S, Cunha AP, Fricke PM. Increased fertility in lactating dairy cows resynchronized with Double-Ovsynch compared with Ovsynch initiated 32 d after timed artificial insemination. *J Dairy Sci.* 2012 Feb;95(2):639-53
 - 41) Hackbart KS, Cunha PM, Meyer RK, Wiltbank MC. Effect of glucocorticoid-induced insulin resistance on follicle development and ovulation in dairy cows. *Biol Reprod* 2013 DOI:10.1095/biolreprod.113.107862.
 - 42) Ayres H, Ferreira RM, Cunha AP, Araújo RR, Wiltbank MC. Double-Ovsynch in high-producing dairy cows: Effects on progesterone concentrations and ovulation to GnRH treatments. *Theriogenology.* 2013 Jan 1;79(1):159-64. Epub 2012 Oct 31.
 - 43) Diaz FJ, Luo W, Wiltbank MC. Prostaglandin F_{2α} regulation of mRNA for activating protein 1 transcriptional factors in porcine corpora lutea (CL): lack of induction of JUN and JUND in CL without luteolytic capacity. *Domest Anim Endocrinol.* 2013 Feb;44(2):98-108. Epub 2012 Oct 8.

Abstracts

Hand, J. M. and Yao, J. Identification of a novel gene encoding a zinc finger protein in bovine oocytes. 45th Ann. Meeting Soc. Study Reprod., State College, PA. August 12-15, 2012. Abstr. 219.

Wang, L. and Yao, J. Identification of interaction partners of KPNA7 and epigenetic regulations of its expression during maternal-embryonic transition. 45th Ann. Meeting Soc. Study Reprod., State College, PA. August 12-15, 2012.

Bowdridge E. C., J. Flores, E.K. Inskeep. 2012. Is AMPK required to mediate the steroidogenic actions of PGF2alpha in bovine corpus luteum 45th Ann. Meeting Society Study Reprod., State College, PA. August 12-15, 2012. Abstr. 172.

DeSouza, K.N., Simpson-Rastle, S.L., Baptiste, Q.S. and Knights, M. (2012). Prostaglandin-F2 α may not be necessary in short-term Progesterone-based estrous synchronization protocols in cyclic ewes. Joint Annual Meeting of the ADSA/ASAS Phoenix, AZ, USA, July 15-19, 2012. J. Anim. Sci. 90: (Suppl. 3):71.

Deacon, Matthew 2012. Effects of artificial photoperiod on spring breeding of fall-born Dorset ewe lambs. Proc. 24th Tech. Conf. on A.I and Reprod. Nat. Assoc. Anim Breeders, Milwaukee WI, Sept.20-21. 2 pp.

Dogan S, Mason M, Govindaraju A, Belser LE, Kaya A, Stokes J, Memili E. (2012) Can apoptotic markers in spermatozoa predict male fertility? European Society of Human Reproduction and Embryology Annual Conference.

Dogan S, de Oliveira RV, Belser LE, Moura A, Topper E, Kaya A, Memili E. (2012) Dynamics of sperm chromatin associated with bull fertility. Society for the Study of Reproduction Annual Conference.

Tian X and Diaz FJ. (2012). Zinc deficiency during oocyte maturation causes defects in preimplantation embryonic development. *Proceedings of the 45th Annual Meeting of the Society for Study of Reproduction*, University Park, PA, Accepted #199.

Lisle R, Randall M and Diaz FJ. (2012). Cumulus cell paracrine factors regulate zinc homeostasis in the oocyte. *Proceedings of the 45th Annual Meeting of the Society for Study of Reproduction*, University Park, PA, Accepted #565.

Vasudevan, S, Kamat, M., Walusimbi, S, Pate, J. and Ott, T. (2013). Effects of early pregnancy on endometrial NK cells and CD8+ cells in dairy heifers. Am. J. Reprod. Immunol. Vol. 69 (2); pg 157.

Kamat, M., Maalouf, S., Vasudevan, S., Pate, J. and Ott, T. (2013). Effects of early pregnancy on monocytes, macrophages and dendritic cells in peripheral blood and endometrium of dairy heifers. *Proceedings of the 46th Annual Meeting of the Society for the Study of Reproduction*, Montreal, Canada. Accepted #871.

Toyokawa, K, Pate JL. 2012. Roles of paracrine factors from bovine luteal cells on T cell function. SSR Abstract #44

Maalouf, S, Toyokawa, K, Pate, JL. 2012. MicroRNA-126 may regulate survival of endothelial cells in the corpus luteum. SSR Abstract #48

Pate, JL, Poole, DH, Walusimbi, S, Brzezicka, E. 2012. Immune Cells in the Ruminant Corpus Luteum: Friends or Foes? SSR Abstract #99

Pate, JL, Walusimbi, SS. 2012. Gamma-Delta T Cell Subsets Differentially Respond to Bovine Luteal Cells. SSR Abstract #171

Brzezicka, E, Pate, J. 2012. Effect of Alpha 2 Macroglobulin on Luteal Cell Induced Gamma Delta T Lymphocyte Proliferation. SSR Abstract #178

Walusimbi, SS, Steinberger, LM, Pate, JL. 2012. Gene Expression, Localization, and Regulation of Activated Leukocyte Cell Adhesion Molecule/CD166 in the Bovine Corpus Luteum. SSR Abstract #186

Oh, J, Hristov, AN, Lee, C, Heyler, K, Cassidy, T, Pate, J, Walusimbi, S, Brzezicka, E, Toyokawa, K, Werner, J, Bravo, D. 2012. Effect of post-ruminal supplementation of plant extracts on immune response, blood cell counts, and blood chemistry in lactating dairy cows. *J. Dairy Sci.* 95(Suppl. 2):180.

Cummings C, Coticchia CM, Elder D, Tsang PCW, Moses MA 2012. CCN1 (Cysteine Rich 61-Connective Tissue Growth Factor-Nephroblastoma Overexpressed) and the expression of integrins by bovine ovarian follicles. SSR Abstract #509

Kinsman SE, Davis JS, Townson DH 2012. Investigation of the role of cytokeratin 8/18 intermediate filaments in granulosa cell fate. SSR Abstract #513

Tsang PCW, Coticchia CM, Miseirvitch J, Clark J, Davis JS, Moses MA 2012. Are CCN1 (Cysteine Rich 61-Connective Tissue Growth Factor-Nephroblastoma Overexpressed) and integrin receptor subunits expressed by KGN, an ovarian granulosa tumor cell line? SSR Abstract #551

Norwood KA, Brandt AK, and Wood JR (2012) Maternal Obesity Induces Placenta Oxidative Stress and Alters the Differentiation of Mesodermal Cells to the Myogenic versus Adipogenic Lineage. *Society for the Study of Reproduction 44th Annual Meeting*, State College, PA

Summers AF, Pohlmeier WE, McFee RM, Brauer VM, Kurz S, Cushman RA, Wood JR, and Cupp AS (2012) VEGF164B mRNA Abundance has a Positive Relationship to AMH, BCL2 and the Ratio of E2:A4 in Mural Granulosa Cells of Estrogen Active and Inactive Follicles Prior to Ovulation. *Society for the Study of Reproduction 44th Annual Meeting*, State College, PA

Schneider A, Correa MN, and Butler WR. 2012, Effect of GHR AluI polymorphism on reproductive performance of Holstein cows. *J Dairy Sci* 95(Suppl 2): 401

Allen JJ, Herrick SL, Fortune JE. 2012, Regulation of steroid production in bovine fetal ovaries. SSR 44th Annual Meeting, State College PA

Cerny, K., M. Van Fleet, A. Slepenskin, E.M. Peterson and P.J. Bridges. 2013. Differential expression of mRNA encoding cytokines and chemokines in the reproductive tract after infection of mice with *Chlamydia trachomatis*. *Biol. Reprod. Special Issue, Proc. of the 46th annual meeting of the Soc. for the Study of Reproduction*, Abstract #745.

Garbacik, S., J.C. Matthews, K. Cerny and P.J. Bridges. 2013. Gestational form of supplemental selenium (Se) affects gene expression in the newborn calf testis. I. Steroidogenesis. *Journal of Animal Science*. Abstract W370.

Skees, C., P.J. Bridges, J. Patterson and J.C. Matthews. 2013. Gestational form of supplemental selenium (Se) affects gene expression in the newborn calf testis. II. Spermatogenesis. Journal of Animal Science. Abstract T333.

Extension Bulletins

Radio shows: The research on functional genomics of the gametes and embryos was disseminated through Extension Service of Mississippi State University's Farm and Family Radio Programs (<http://msucares.com/news/radio/farmandfamily/index.html>).

Undergraduates empowered with research in this area have presented their research at conferences as well as at the Public Radio: http://msucares.com/news/radio/farmandfamily/archive_11.html

International visiting scientist, a Fulbright scholar, has also done research on sperm epigenome and his work was featured at MSU's "Our People" program: <http://www.msstate.edu/web/people/detail.php?id=228>

Science teachers from K12 were also trained and featured at MSU: <http://msucares.com/news/print/agnews/an12/120719science.html>

Book Chapters

Tripurani, S.K., Yao J. and Smith, G.W. 2013. Bovine oocyte gene expression: Identification of functional regulators of early embryogenesis. Oocyte physiology and development in domestic animals Edited by Rebecca Krisher. Wiley-Blackwell.

Ganesan, S., Madden, J.A., Keating, A.F. Ovarian Metabolism of Xenobiotics. In: *Ovarian Toxicology*. Ed. Patricia B. Hoyer. Taylor and Francis Publishing. Chapter 2. *In Press*.

Gilbert GL, Gilbert EA, Govindaraju A, et al. Endocrine control of bull fertility. (2012) In Cattle Domestication, Diseases and the Environment In Cattle Domestication, Diseases and the Environment. G. Liu, editor, Nova Publishers.

Memili E, Dogan S, Rodriguez-Osorio N, Wang X, de Olivera V.R, Mason MC, Govindaraju A, Grant KE, Belser E, Crate E, Moura A, Kaya A. Makings of the best spermatozoa: Molecular determinants of high fertility. (2012) In Male Fertility. Editors: A. Bashamboo and K. D. McElreavey. InTech - Open Access Publisher

Rodriguez-Osorio N, Dogan S, Memili E. Epigenetics of mammalian gamete and embryo development. (2012) John Wiley & Sons. Editor: H. Khatib. DOI: 10.1002/9781119949930.ch1

Crate EA, Avula R, O'Neal H, Perkins A, Memili E. (2012) Expression Dynamics and Evolution of Sperm PIWIL1, PIWIL2, and AGO2. Molecular Biology of the Cell.

Hristov, A.N., Oh, J., Lee, C., Meinen, R., Montes, F., Ott, T., Firkins, J., Rotz, A., Dell, C., Adesogan, A., Yang, W., Tricarico, J., Kebreab, E., Waghorn, G., Dijkstra, J. & Oosting, S. (2013). *Mitigation of greenhouse gas emissions in livestock production – A review of technical options for non-CO2 emissions*. Edited by Pierre J. Gerber, Benjamin Henderson and Harinder P.S. Makkar. FAO Animal Production and Health Paper No. 177. FAO, Rome, Italy.

Townson DH, Combelles CMH 2012 Ovarian Follicular Atresia. In: Basic Gynecology – Some Related Issues, In Tech Publishing, Atef Darwish (Ed), Rijeka, Croatia. pp. 43-76. ISBN 978-953-51-0166-6.

Theses/Dissertations :

Walusimbi, SS. 2012. Regulation of the recruitment and function of T lymphocytes by endothelial and steroidogenic cells. PhD Dissertation, The Pennsylvania State University

Brzezicka, E. 2013. Interactions between luteal cells and T cells in the bovine corpus luteum : The paracrine mechanism of luteal cell-induced T cell activation. PhD. Dissertation, University of Olsztyn

Kinsman SE 2012 Keratin 8/18 filaments : Potential modulators of death signaling in ovarian granulosa cells. MS Thesis, University of New Hampshire

Hackbart, K.S., 2013. Development of a bovine model to study the effects of insulin resistance on ovarian function. Ph.D. dissertation. University of Wisconsin-Madison

Bender, R.W. 2012. Effects of acute feed restriction combined with targeted use of increasing LH content of FSH preparations on superovulation and embryo quality in lactating dairy cows. M.S. thesis. University of Wisconsin-Madison

Current Funding

USDA Proposal number: 2009-01853 Regulation of Corpus Luteum Lifespan: Developmental Differences in Signal Transduction Mechanisms Associated with the Luteal PGF₂alpha Receptor, Total Direct and indirect costs: \$338,416. (Jorge Flores)

USDA Proposal number: 2009-01853 Functional Characterization of Bovine Importin $\alpha 8$, A New Member of the Importin α Family Specifically Expressed in Oocytes and Early Embryos, Total Direct and indirect costs: \$347,000. (Jianbo Yao)

WV -140 Out-of-Season Breeding in Sheep, West Virginia State Legislature – E. K. Inskeep, P. E. Lewis, Marlon Knights, Direct Costs: \$86,000 per year

In-Kind Donations (2012 and 2013) – 1250 CIDR-G Inserts (Retail Value \$5.00 each) – Pfizer Animal Health, 1200 CIDR-G Inserts (Retail Value \$5.00 each) – Zoetis Animal Health – E. K. Inskeep and M. Knights \$12,250.00

Agriculture and Food Research Initiative Competitive Grant no. 2012-67015-30212 from the USDA National Institute of Food and Agriculture National Research Initiative to JLP.

FD NIH R03HD057283. Functional analysis of SMAD signaling in oocytes.

National Pork Board. Investigating Biological Reasons for Seasonal Infertility. \$52,369 total costs

Iowa State University College of Human Sciences Seed Grant. Prenatal exposure to glyphosate and aspartame: a possible link with development of obesity? \$25,000 total costs.

National Pork Board. Understanding the biology of seasonal infertility to develop mitigation strategies for swine. \$154,919 total costs

NRICGP/USDA Grant #2007-35203-18074, "Role of Cytokeratin 8/18 Filaments in Fas Ligand-Induced Apoptosis of Ovarian Steroidogenic Cells". D. Townson

USDA (NRICGP, #2008-35203-05989); 9/30/09-8/31/12; PI - 15% effort, "Effects of Fetal Steroids on the Formation of Ovarian Follicles and on their Competence to Initiate Growth", JE Fortune

NIH (R21 HD0602322); 07/01/09- 06/30/13; PI – 20% effort, "Role of Fetal Steroids on the Formation and Activation of Bovine Ovarian Follicles", JE Fortune

USDA Formula Funds (Hatch Program), 2009-2014 Effects of Endocrine Disrupting Chemicals (Estrogens) on Bovine Ovaries, JE Fortune

UNL Office of Research Faculty Seed Grant: Impact of Increased Maternal RNAs on Embryonic Development; Wood JR (PI); 01/2013 – 12/2013; \$10,000