

Heewon Seo, Ph.D.

Research Assistant Professor | Department of Veterinary Integrative Biosciences | Texas A&M University
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EDUCATION

Ph.D. Reproductive Biology, 2012

Biological Resources and Technology, Yonsei University, Wonju, South Korea

M.S. Reproductive Biology, 2007

Biological Resources and Technology, Yonsei University, Wonju, South Korea

B.S. Biotechnology, 2005

Biological Resources and Technology, Yonsei University, Wonju, South Korea

POSITIONS

Research Assistant Professor, 2018 (June) – Present

Department of Veterinary Integrative Biosciences, Texas A&M University, College Station, TX, USA

Postdoctoral Research Associate, 2013 (May) – 2018 (May)

Department of Veterinary Integrative Biosciences, Texas A&M University, College Station, TX, USA

Postdoctoral Research Associate, 2012 (September) – 2013 (April)

Department of Biological Resources and Technology, Yonsei University, Wonju, South Korea

AWARDS

- 2019 Excellent Poster Presentation Award, 3rd place, the 25th Annual Meeting of Texas Forum for Reproductive Sciences
- 2016 Trainee Research Finalist for the Platform Award, 49th Annual Meeting of the Society for the Study of Reproduction
- 2016 USDA-NIFA-AFRI Merit Award, 49th Annual Meeting of the Society for the Study of Reproduction
- 2011 Excellent Presentation Award, The 11th International Symposium on Developmental Biotechnology
- 2011 Excellent Presentation Award, Korean Society of Animal Reproduction
- 2008 Scholarship, Korea Science and Engineering Foundation, Ministry of Science and Technology
- 2006 Excellent Presentation Award, The 6th International Symposium on Developmental Biotechnology

RESEARCH SUPPORT

Ongoing Research Support

USDA-NIFA-AFRI, **H. Seo (Co-PI)**, G. Johnson (PI), F. Bazer (Co-PI). *Metabolic adaptation of conceptuses to a hypoxic uterine environment*. 1/01/2022~12/31/2026, \$650,000 total costs.

USDA-NIFA-AFRI, **H. Seo (PI)**, G. Johnson (Co-PI), F. Bazer (Co-PI), G. Wu (Co-PI). *Glutaminolysis provides TCA cycle intermediates necessary for proliferation in the conceptus trophectoderm of pigs*. 6/01/2020~5/31/2023, \$500,000 total costs.

Grant Submissions

USDA-NIFA-AFRI, **H. Seo (Co-PI)**, G. Johnson (PI), F. Bazer (Co-PI). *Paracrine and autocrine signaling between the conceptus and uterus in pigs*. Submitted in May, 2021.

Completed Research Support

USDA-NIFA-AFRI (2016), **H. Seo (Co-Investigator)**, G. Johnson (PI). *Paracrine and autocrine signaling between the conceptus and uterus in pigs*. 3/01/2016~2/29/2020, \$460,000 total costs.

CVM Postdoctoral Research Mini-Grant Award (2015), *Endometrial response to mechanical forces for development of uterine-placental folds in pigs*. 2/29/2015~8/31/2015, \$10,000 total costs.

PROFESSIONAL SERVICES

Ad Hoc Review

BMC Genetics (1 manuscript)

Cells (2 manuscripts)

Innate Immunity (1 manuscript)

International Journal of Environmental Research and Public Health (4 manuscripts)

International Journal of Molecular Sciences (9 manuscripts)

Reproduction (22 manuscripts)

Scientific Reports (2 manuscripts)

The FASEB Journal (1 manuscript)

Theriogenology (1 manuscript)

Committees

Member, Public Affairs committee, Society for the Study of Reproduction (2021-present)

Member, VIBS-Research faculty committee (2020-present)

Memberships

Faculty Member, Interdisciplinary Faculty of Reproductive Biology (2020-present)

Regular Member, Society for the Study of Reproduction (2019-present)

TEACHING EXPERIENCE

2011 Lecturer for General Biology and Experimental Concepts (1 semester)

2009-2010 Undergraduate Teaching Assistant for General Biology and Experiment

2007-2010 Undergraduate Teaching Assistant for Animal Reproductive Biotechnology & Laboratory

Graduate Committee

Karina Hissen (Criscitiello Lab, TAMU BIMS, 2022-present, Committee Member)

Joe Cain (Johnson Lab, TAMU BIMS, 2021-present, Co-Chair)

Avery Kramer (Johnson Lab, TAMU BIMS, 2016-2021, Research Mentorship)

Bryan McLendon (Johnson Lab, TAMU BIMS, 2016-2021, Research Mentorship)

PUBLICATIONS

Peer-Reviewed Journals

49. Wu G, Xilong Li, **Seo H**, McLendon BA, Kramer AC, Zhu C, Burghardt RC, Bazer FW, and Johnson GA. Osteopontin (OPN)/Secreted Phosphoprotein 1 (SPP1) engages integrins to increase ion transport across the porcine placenta. *Frontiers in Bioscience-Landmark* 2022 January; *submitted*.
48. Johnson GA, **Seo H**, Bazer FW, Wu G, Kramer AC, McLendon BA, Caine JW. Metabolic pathways utilized by the porcine conceptus, uterus and placenta. *Molecular Reproduction and Development* 2022 January; *submitted*.
47. Stenhouse C, **Seo H**, Wu G, Johnson GA, Bazer FW. Insights into the Regulation of Implantation and Placentation in Humans, Rodents, Sheep, and Pigs. *Adv Exp Med Biol.* 2022;1354:25-48.
46. Moses RM, Kramer AC, **Seo H**, Wu G, Johnson GA, Bazer FW. A role for fructose metabolism in development of sheep and pig conceptuses. *Adv Exp Med Biol* 2022; 1354:49-62.
45. Johnson GA, Bazer FW, **Seo H**. The Early Stages of Implantation and Placentation in the Pig. In: Placentation in Mammals: Tribute to E.C. Amoroso's lifetime contributions to viviparity. *Advances in Anatomy, Embryology and Cell Biology. Ed's R.D. Geisert and T.E. Spencer. Academic Press: Elsevier.* 2021; 61-89.
44. Chen PR, Lucas CG, Cecil RF, Pfeiffer CA, Fudge MA, Samuel MS, Zigo M, **Seo H**, Spate LD, Whitworth KM, Sutovsky P, Wells KD, Geisert RD, Prather RS. Disrupting porcine glutaminase does not block preimplantation development and elongation nor decrease mTORC1 activation in conceptuses. *Biol Reprod* 2021; 105:1104-1113.
43. Kramer AC, Erikson DW, McLendon BA, **Seo H**, Hayashi K, Spencer TE, Bazer FW, Burghardt RC, Johnson GA. SPP1 expression in the mouse uterus and placenta: Implications for implantation. *Biol Reprod* 2021; 105: 892-904.
42. McLendon BA, Kramer AC, **Seo H**, Bazer FW, Burghardt RC, Johnson GA. Integrin Adhesion Complex Organization in Sheep Myometrium Reflects Changing Mechanical Forces during Pregnancy and Postpartum. *Biology* 2021; 10 (6):508.
41. Halloran KM, Hoskins EC, Stenhouse C, Moses RM, Dunlap KA, Satterfield MC, **Seo H**, Johnson GA, Wu G, Bazer FW. Pre-implantation exogenous progesterone and pregnancy in sheep. II. Effects on fetal-placental development in late pregnancy on nutrient transport in late pregnancy. *J Anim Sci Biotechnol* 2021; 12(1):46.
40. Hoskins EC, Halloran KM, Stenhouse C, Moses RM, Dunlap KA, Satterfield MC, **Seo H**, Johnson GA, Wu G, Bazer FW. Pre-Implantation Exogenous Progesterone and Pregnancy in Sheep: I. Polyamines, Nutrient Transport, and Progestamedins. *J Anim Sci Biotechnol* 2021; 5:12(1):39.
39. Bazer FW, **Seo H**, Johnson GA, Wu G. One-Carbon Metabolism and Development of the Conceptus During Pregnancy: Lessons from Studies with Sheep and Pigs. *Adv Exp Med Biol* 2021; 1285:1-15.
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37. Johnson GA, Kramer AC, Steinhauser C, **Seo H**, McLendon BA, Burghardt RC, Wu G, Bazer FW. Steroids Regulate SLC2A1 and SLC2A3 to Deliver Glucose into Trophoctoderm for Metabolism via Glycolysis. *J Anim Sci* 2020; 98: 188-188.
36. **Seo H**[#], Frank JW[#], Burghardt RC, Bazer FW, Johnson GA. Integrins and OPN Localize to Adhesion Complexes during Placentation in Sheep. *Reproduction* 2020; 160:521-532. #, co-first authors.
35. McLendon BA[#], **Seo H**[#], Kramer AC, Burghardt RC, Bazer FW, Johnson GA. Pig Conceptuses Secrete Interferon Gamma to Recruit T cells to the Endometrium during the Peri-Implantation Period. *Biol Reprod* 2020; 103:1018-1029. #, co-first authors.

34. Kramer AC, Steinhauser CB, Gao H, **Seo H**, McLendon BA, Burghardt RC, Wu G, Bazer FW, Johnson GA. Steroids Regulate SLC2A1 and SLC2A3 to Deliver Glucose into Trophectoderm for Metabolism via Glycolysis. *Endocrinology* 2020; 161:1-2
Commentary: Mathew DJ. Glucose and Fructose transport across the epitheliochorial placenta: SLC2A and the uterine-placental interface in pigs. *Endocrinology* 2020; 161:1-2.
33. Bazer FW, **Seo H**, Wu G, Johnson GA. Interferon Tau: Influences on Growth and Development of the Conceptus. *Theriogenology* 2020; 150:75-83.
32. **Seo H**, Li X, Wu G, Bazer FW, Burghardt RC, Bayless KJ, Johnson GA. Mechanotransduction Drives Morphogenesis to Develop Folding during Placental Development in Pigs. *Placenta* 2020; 90:62-70.
31. Yoo I, **Seo H**, Choi Y, Jang H, Han J, Lee S, Choi Y, Ka H. Analysis of Interferon- γ Receptor IFNGR1 and IFNGR2 Expression and Regulation at the Maternal-Conceptus Interface and the Role of Interferon- γ on Endometrial Expression of Interferon Signaling Molecules during Early Pregnancy in Pigs. *Mol Reprod Dev* 2019; 86(12):1993-2004.
30. **Seo H**, Bazer FW, Burghardt RC, Johnson GA. Immunohistochemical Examination of Trophoblast Syncytialization during Early Placentation in Sheep. *Int J Mol Sci* 2019; 20(18):4530.
29. Choi Y, Jang H, **Seo H**, Yoo I, Han J, Kim M, Lee S, Ka H. Changes in calcium levels in the endometrium throughout pregnancy and the role of calcium on endometrial gene expression at the time of conceptus implantation in pigs. *Mol Reprod Dev* 2019; 86(7):883-895.
28. Johnson GA, Bazer FW, Burghardt RC, Wu G, **Seo H**, Kramer AC, McLendon BA. Cellular events during ovine implantation and impact for gestation. *Animal Reproduction* 2018; 15(Suppl. 1):843-855.
27. Ka H, **Seo H**, Choi Y, Yoo I, and Han J. Endometrial Response to Conceptus-Derived Estrogen and Interleukin-1 β at the Time of Implantation in Pigs. *J Anim Sci Biotechnol* 2018; 9:44.
26. Han H, **Seo H**, Choi Y, Lee C, Kim MI, Jeon Y, Lee J, Hong M, Hyun SH, Lee E, and Ka H. Expression and Regulation of Inhibitor of DNA Binding Proteins ID1, ID2, ID3, and ID4 at the Maternal-Conceptus Interface in Pigs. *Theriogenology* 2018; 108:46-55.
25. Davis-Anderson KL, Berger S, Lunde-Young ER, Naik VD, **Seo H**, Johnson GA, Steen H, Ramadoss J. Placental Proteomics Reveal Insights into Fetal Alcohol Spectrum Disorders. *Alcohol Clin Exp Res* 2017; 41(9):1551-1558.
24. Wu G, Bazer FW, Johnson GA, Herring C, **Seo H**, Dai Z, Wang J, Wu Z, and Wang X. Functional Amino Acids in the Development of the Pig Placenta. *Mol Reprod Dev* 2017; 84(9):870-882.
23. Frank JW, **Seo H**, Burghardt RC, Bayless KJ, Johnson GA. ITGAV (Alpha V Integrins) Bind SPP1 (Osteopontin) to Support Trophoblast Cell Adhesion. *Reproduction* 2017; 153(5):695-706.
22. Choi Y[#], **Seo H**[#], Han J, Yoo I, Kim J, and Ka H. Chemokine (C-C motif) Ligand 28 and Its Receptor CCR10: Expression and Function at the Maternal-Conceptus Interface in Pigs. *Biol Reprod* 2016; 95(4):84.
#, co-first authors
21. Jeong W, **Seo H**, Sung Y, Ka H, Song G, Kim J. Lysophosphatidic Acid (LPA) Receptor 3-Mediated LPA Signal Transduction Pathways: A Possible Relationship with Early Development of Peri-Implantation Porcine Conceptus. *Biol Reprod* 2016; 94(5):104.
20. Dave JM, Abbey CA, Duran CL, **Seo H**, Johnson GA, Bayless KJ. Hic-5 mediates endothelial sprout initiation by regulating a key surface metalloproteinase. *J Cell Sci* 2016; 129(4):743-56.
19. Kim M, **Seo H**, Choi Y, Yoo I, Seo M, Lee CK, Kim H, Ka H. Analysis of Stage-Specific Gene Expression Profiles in the Uterine Endometrium during Pregnancy in Pigs. *Plos one* 2015; 10(11):e0143436.
18. **Seo H**, Choi Y, Shim J, Yoo I, Ka H. Comprehensive Analysis of Prostaglandin Metabolic Enzyme

Expression During Pregnancy and the Characterization of AKR1B1 as a Prostaglandin F Synthase at the Maternal-Conceptus Interface in Pigs. *Biol Reprod* 2014; 90:99.

17. **Seo H**, Choi Y, Shim J, Yoo I, Ka H. Prostaglandin Transporters, ABCC4 and SLCO2A1, in the Uterine Endometrium and Conceptus During Pregnancy in Pigs. *Biol Reprod* 2014; 90:100.
16. Choi Y, **Seo H**, Shim J, Yoo I, Ka H. Calcium extrusion regulatory molecules: differential expression during pregnancy in the porcine uterus. *Domest Anim Endocrinol* 2014; 47:1-10.
15. **Seo H**, Choi Y, Yoo I, Shim J, Lee CK, Hyun SH, Lee E, Ka H. Analysis of ENPP2 in the Uterine Endometrium of Pigs Carrying Somatic Cell Nuclear Transfer Cloned Embryos. *Asian-Aust J Anim Sci* 2013; 26:1255-1261.
14. Shim J, **Seo H**, Choi Y, Yoo I, Lee CK, Hyun SH, Lee E, Ka H. Analysis of legumain and cystatin 6 expression at the maternal-fetal interface in pigs. *Mol Reprod Dev* 2013; 80: 570-580.
13. **Seo H**, Choi Y, Shim J, Kim M, Ka H. Analysis of a lysophosphatidic acid-generating enzyme ENPP2 in the uterus during pregnancy in pigs. *Biol Reprod* 2012; 87:77.
12. **Seo H**, Choi Y, Shim J, Choi Y, Ka H. Regulatory mechanism for expression of IL1B receptors in the uterine endometrium and effects of IL1B on prostaglandin synthetic enzymes during the implantation period in pigs. *Biol Reprod* 2012; 87:31.
11. Kim M, **Seo H**, Choi Y, Shim J, Kim H, Lee CK, Ka H. Microarray analysis of gene expression in the uterine endometrium during the implantation period in pigs. *Asian-Aust J Anim Sci* 2012; 25:1102-1116.
10. Kim M, **Seo H**, Choi Y, Shim J, Bazer FW, Ka H. Swine leukocyte antigen-DQ expression and its regulation by interferon-gamma at the maternal-fetal interface in pigs. *Biol Reprod* 2012; 86:43.
9. Choi Y, **Seo H**, Shim J, Kim M, Ka H. Regulation of S100G expression in the uterine endometrium during early pregnancy in pigs. *Asian-Aust J Anim Sci* 2012; 25:44-51.
8. Seo KS, Naidansuren P, Kim SH, Yun SJ, Park JJ, Sim BW, Park CW, Nanjidsuren T, Kang MH, **Seo H**, Ka H, Kim NH, Hwang SY, Yoon JT, Yamanouchi K, Min KS. Expression of aldo-keto reductase family 1 member C1 (AKR1C1) gene in porcine ovary and uterine endometrium during the estrous cycle and pregnancy. *Reprod Biol Endocrinol* 2011; 9:139.
7. Kim M, Shim J, **Seo H**, Choi Y, Lee CK, Ka H. Activated leukocyte cell adhesion molecule: expression in the uterine endometrium during the estrous cycle and pregnancy in pigs. *Asian-Aust J Anim Sci* 2011; 24:919-928.
6. **Seo H**, Kim M, Choi Y, Ka H. Salivary lipocalin is uniquely expressed in the uterine endometrial glands at the time of conceptus implantation and induced by interleukin-1beta in pigs. *Biol Reprod* 2011; 84:279-287.
5. Choi Y, **Seo H**, Kim M, Ka H. Dynamic expression of calcium-regulatory molecules, TRPV6 and S100G, in the uterine endometrium during pregnancy in pigs. *Biol Reprod* 2009; 81:1122-1130.
4. Kim M, **Seo H**, Choi Y, Hwang W, Lee CK, Ka H. Aberrant expression of retinol-binding protein, osteopontin and fibroblast growth factor 7 in the porcine uterine endometrium of pregnant recipients carrying embryos produced by somatic cell nuclear transfer. *Anim Reprod Sci* 2009; 112:172-181.
3. Ka H, **Seo H**, Kim M, Choi Y, Lee CK. Identification of differentially expressed genes in the uterine endometrium on day 12 of the estrous and pregnancy in pigs. *Mol Reprod Dev* 2009; 76:75-84.
2. **Seo H**, Kim M, Choi Y, Lee CK, Ka H. Analysis of lysophosphatidic acid (LPA) receptor and LPA-induced endometrial prostaglandin-endoperoxide synthase 2 expression in the porcine uterus. *Endocrinology* 2008; 149:6166-6175.

1. Ka H, **Seo H**, Kim M, Moon S, Kim H, Lee CK. Gene expression profiling of the uterus with embryos cloned by somatic cell nuclear transfer on day 30 of pregnancy. *Anim Reprod Sci* 2008; 108:79-91.

Peer-Reviewed Journals (Korean Domestic)

9. Choi Y, **Seo H**, Shim J, Hyun SH, Lee E, Ka H. Klotho: Expression and Regulation at the Maternal-Conceptus Interface in Pigs. *J Emb Trans* 2014; 29(4):375-383.
8. Choi Y, **Seo H**, Yoo I, Han J, Jang H, Kim M, Ka H. Maternal-conceptus interactions: mediators regulating the implantation process in pigs. *Reprod Dev Biol* 2014; 38(1):9-19.
7. **Seo H**, Ka H. Expression of lysophosphatidic acid receptor 3 in the uterine endometrium of pigs with somatic cell nuclear transfer cloned conceptuses. *J Anim Sci Technol* 2011; 53(3):203-209.
6. Choi Y, **Seo H**, Kim M, Ka H. Analysis of decorin expression in the uterine endometrium during the estrous cycle and pregnancy in pigs. *Reprod Dev Biol* 2010; 34:95-101.
5. **Seo H**, Kim M, Ka H. Identification of ligand for salivary lipocalin secreted from the uterine endometrium during early pregnancy in pigs. *J Emb Trans* 2009; 24:259-263.
4. **Seo H**, Kim M, Choi Y, Ka H. Analysis of lysophosphatidic acid receptor 1 expression in the uterus during the estrous cycle and pregnancy in pigs. *Reprod Dev Biol* 2009; 33:147-152.
3. **Seo H**, Park DY, Kim M, Ahn MH, Ko K, Ko K, Ka H. Establishment of baculovirus infected insect cell line expressing porcine salivary lipocalin (SAL1) protein. *Reprod Dev Biol* 2009; 33:71-76.
2. Kim M, **Seo H**, Choi Y, Lee CK, Ka H. Comparative analysis of gene expression in the female reproductive organs. *J Emb Trans* 2009; 24:77-87.
1. Kim M, Park C, Lee S, **Seo H**, Choi Y, Lee CK, Ka H. Factors affecting the efficiency of animal cloning by somatic cell nuclear transfer. *J Emb Trans* 2008; 23:67-76.

Manuscripts in Preparation

Moses RM, Kramer AC, Stenhouse C, Halloran KM, Sah N, **Seo H**, Johnson GA, Wu G, and Bazer FW. Fructose as a substrate for the pentose phosphate pathway and Krebs's cycle in ovine conceptuses during the peri-implantation period of pregnancy.

Kramer AC[#], **Seo H**[#], McLendon BA, Wu G, Burghardt RC, Bazer FW, Johnson GA. Porcine conceptuses utilize the pentose phosphate pathway to support development during the peri-implantation period of pregnancy. [#], co-first authors.



Seo H, Bazer FW, Burghardt RC, Johnson GA. Osteopontin and integrins are expressed by migrating cells in placentomal and inter-placentomal regions of the developing ovine placenta.



INVITED ORAL PRESENTATION

10. *Comparative Analyses of Placentation in Domestic Species* at the International Symposium on Developmental Biotechnology, South Korea, October 2021.

9. *New Insights into the Histologic and Metabolic Basis for Early Placental Development in Pigs, Sheep, Cattle, and Baboons* at the Interdisciplinary Faculty of Reproductive Biology seminar, College Station, TX, April 2021.
8. *Sheep and Pig Conceptuses Adapt to a Hypoxic Uterine Environment by Enhancing One-Carbon Metabolism* at the 24th Annual meeting of Texas Forum for Reproductive Sciences, Houston, Texas, April 2018.
7. *Implantation and Early Placentation within a Hypoxic Uterine Environment in Sheep and Pigs* at the Interdisciplinary Faculty of Reproductive Biology seminar, College Station, TX, 2018.
6. *Syncytial Trophoblast Fusion and Breaching of Uterine Luminal Epithelium in Sheep*, Trainee Research Finalist Platform Presentation at the 49th Annual Meeting of the Society for the Study of Reproduction, San Diego, July 2016.
5. *Mechanotransduction Drives Morphogenesis to Develop Folding at the Uterine-Placental Interface of Pigs* at the 48th Annual Meeting of the Society for the Study of Reproduction, San Juan, Puerto Rico, June 2015.
4. *Mechanotransduction Drives Morphogenesis to Develop Folding at the Uterine-Placental Interface of Pigs* at the 21st Annual meeting of Texas Forum for Reproductive Sciences, Houston, Texas, April 2015.
3. *Syncytialization during Implantation in Sheep* at the Interdisciplinary Faculty of Reproductive Biology seminar, College Station, TX, October 2015
2. *Focal adhesion-anchored stress fibers and differentiation of fibroblast into myofibroblast are associated with morphogenesis of uterine-placental villi in pigs* at the Mechanotransduction in the Reproductive Tract Meeting, Durham, NC, October 2014.
1. *Enrichment of Polymerized Actin and Myofibroblast Differentiation Are Associated with Morphogenesis of Uterine-Placental Villi in Pigs* at the Interdisciplinary Faculty of Reproductive Biology seminar, College Station, TX, 2014

ABSTRACTS

60. Halloran KM, Hoskins EC, Stenhouse C, Moses RM, **Seo H**, McLendon BA, Dunlap KA, Satterfield MC, Johnson GA, Wu G, Bazer FW. Progesterone Regulates the Biosynthesis and Interconversion of Polyamines in the Sheep Endometrium During Pregnancy. Annual Meeting for the Society for the Study of Reproduction, 2021.
59. Moses RM, Stenhouse C, Halloran KM, Sah N, Kramer AC, McLendon BA, **Seo H**, Johnson GA, Wu G, Bazer FW. Fructose Metabolism by the Sheep Conceptus During the Peri-Implantation Period of Pregnancy. Annual Meeting for the Society for the Study of Reproduction, 2021.
58. Kramer AC, **Seo H**, McLendon BA, Burghardt RC, Wu G, Bazer FW, Johnson GA. Porcine Conceptuses Utilize the Pentose Phosphate Pathway to Support Development during the Peri-Implantation Period of Pregnancy. Annual Meeting for the Society for the Study of Reproduction, 2021.
57. Stenhouse C, Halloran KM, Hoskins EC, Moses RM, **Seo H**, Dunlap KA, Satterfield MC, Johnson GA, Wu G, Bazer FW. Exogenous Progesterone in Early Pregnancy has Programming Effects on Phosphate, Calcium, and Vitamin D Signaling in the Ovine Endometrium and Placenta in Late Pregnancy. Annual Meeting for the Society for the Study of Reproduction, 2021.
56. McLendon BA, **Seo H**, Kramer AC, Burghardt RC, Wu G, Bazer FW, Johnson GA. Porcine conceptus IFNG is post-transcriptionally regulated and released from the trophoblast via extracellular vesicles to recruit metabolically activated T cells. Annual Meeting for the Society for the Study of Reproduction, 2021.

55. Pohler K, Johannsen GF, Ortega S, Melo G, Timlin C, Mercadante V, Lee K, **Seo H**. Conceptus Development and Transcriptome Differences Between Parthenogenetic and Control Bovine Embryos. Annual Meeting for the Society for the Study of Reproduction, 2021.
54. Sah N, Stenhouse C, Halloran KM, Moses RM, **Seo H**, Johnson GA, Wu G, Bazer FW. Ovine Utero-Placental Tissues Metabolize Creatine During Pregnancy to Support Conceptus Development. Annual Meeting for the Society for the Study of Reproduction, 2021.
53. Kramer AC, **Seo H**, McLendon BA, Burghardt RC, Wu G, Bazer FW, Johnson GA. Porcine Conceptuses Utilize the Pentose Phosphate Pathway to Support Development during the Peri-Implantation Period of Pregnancy. 26st Annual meeting of Texas Forum for Reproductive Sciences, 2021.
52. McLendon BA, **Seo H**, Kramer AC, Burghardt RC, Wu G, Bazer FW, Johnson GA. Porcine conceptus IFNG is post-transcriptionally regulated and released from the trophoctoderm via extracellular vesicles to recruit metabolically activated T cells. 26st Annual meeting of Texas Forum for Reproductive Sciences, 2021.
51. Halloran KM, Hoskins EC, Stenhouse C, Moses RM, **Seo H**, Dunlap KA, Satterfield MC, Johnson GA, Wu G, Bazer FW. Progesterone regulates the biosynthesis and interconversion of polyamines in the sheep endometrium during the pre-implantation period of pregnancy. 26st Annual meeting of Texas Forum for Reproductive Sciences, 2021.
50. Moses RM, Stenhouse C, Halloran KM, Sah N, Kramer AC, McLendon BA, **Seo H**, Johnson GA, Wu G, Bazer FW. Fructose metabolism by the sheep conceptus as a mechanism for adapting to hypoxia. 26st Annual meeting of Texas Forum for Reproductive Sciences, 2021.
49. Sah N, Stenhouse C, Halloran KM, Moses RM, **Seo H**, Johnson GA, Wu G, Bazer FW. The Creatine Metabolic Pathway in Ovine Utero-Placental Tissues During the Peri-Implantation Period and in Late-Stage of Pregnancy. 26st Annual meeting of Texas Forum for Reproductive Sciences, 2021.
48. Stenhouse C, Halloran KM, Hoskins EC, Moses RM, **Seo H**, Dunlap KA, Satterfield MC, Wu G, Johnson GA, Gaddy D, Suva LJ, Bazer FW. Exogenous Progesterone in Early Pregnancy has Programming Effects on Phosphate, Calcium, and Vitamin D Signaling in the Ovine Endometrium and Placenta in Late Pregnancy. 26st Annual meeting of Texas Forum for Reproductive Sciences, 2021.
47. **Seo H**, Kramer AC, McLendon BA, Burghardt RC, Wu G, Bazer FW, Johnson GA. Glutaminolysis Drives TCA Cycle Anaplerosis through Oxidative and Reductive Pathways to Support Nucleotide and Lipid Biosynthesis in Pig Conceptuses. Annual Meeting for the Society for the Study of Reproduction, 2020.
46. McLendon BA, **Seo H**, Kramer AC, Burghardt RC, Wu G, Bazer FW, Johnson GA. Immunometabolism Regulates the Production of IFNG by Elongating Conceptuses and the Function of Immune Cells in the Endometrium of Pigs. Annual Meeting for the Society for the Study of Reproduction, 2020.
45. Kramer AC, **Seo H**, McLendon BA, Burghardt RC, Wu G, Bazer FW, Johnson GA. Porcine Conceptuses Utilize the Polyol Pathway and Fructose-Driven Glycolysis (Fructolysis) to Support Development during the Peri-Implantation Period of Pregnancy. Annual Meeting for the Society for the Study of Reproduction, 2020.
44. Sah N, Stenhouse C, Halloran KM, Moses RM, **Seo H**, Johnson GA, Wu G, Bazer FW. Inhibition of Mitochondrial SHMT2 Translation in Ovine Conceptuses During the Peri-Implantation Period of Pregnancy Increases Embryonic Mortality. Annual Meeting for the Society for the Study of Reproduction, 2020.
43. Moses RM, Kramer A, Stenhouse C, Halloran KM, Sah N, **Seo H**, Johnson GA, Wu G, Bazer FW. Ovine conceptuses utilize fructose as a substrate for the pentose phosphate pathway during the peri-implantation of pregnancy. Annual Meeting for the Society for the Study of Reproduction, 2020.

42. **Seo H**, Kramer AC, McLendon BA, Wu G, Burghardt RC, Bazer FW, Johnson GA. Elongating Pig Conceptuses Utilize Glucose via Glycolytic Branching Pathway, and Compensate for the Decrease in Available Pyruvate by Utilizing Glutaminolysis to Provide Carbon for the TCA Cycle Anaplerotic Pathway. Annual Meeting for the Society for the Study of Reproduction, 2019.
41. Kramer AC, **Seo H**, McLendon BA, Wu G, Burghardt RC, Bazer FW, Johnson GA. Porcine Conceptuses Differentially Metabolize Glucose and Fructose to Produce Pyruvate and Lactate. Annual Meeting for the Society for the Study of Reproduction, 2019.
40. McLendon BA, **Seo H**, Kramer AC, Herring CM, Wu G, Burghardt RC, Bazer FW, Johnson GA. Pig Conceptuses Secrete Interferon Gamma to Recruit T-Helper and T-Regulatory Cells to the Endometrium to Contribute to a Controlled Inflammatory Environment that Supports Implantation. Annual Meeting for the Society for the Study of Reproduction, 2019.
39. Moses RM, Halloran KM, Stenhouse C, **Seo H**, Johnson GA, Wu G, Bazer FW. Utilization of Glucose and Fructose by the Ovine Conceptus during the Peri-Implantation Period of Pregnancy. Annual Meeting for the Society for the Study of Reproduction, 2019.
38. **Seo H**, Kramer AC, McLendon BA, Wu G, Burghardt RC, Bazer FW, Johnson GA. Sheep and Pig Conceptuses Adapt to a Hypoxic Uterine Environment by Enhancing One-Carbon Metabolism. Annual Meeting for the Society for the Study of Reproduction, 2018.
37. Kramer AC, Erikson DW, **Seo H**, McLendon BA, Bazer FW, Burghardt RC, Johnson GA. Implantation Induces Robust Expression of Secreted Phosphoprotein 1 [SPP1, also known as Osteopontin (OPN)] in the Mouse Endometrium. Annual Meeting for the Society for the Study of Reproduction, 2018.
36. McLendon BA, **Seo H**, Kramer AC, Herring CM, Wu G, Burghardt RC, Bazer FW, Johnson GA. Pig conceptuses secrete interferon gamma (IFNG) to recruit activated T-cells to the uterine endometrium during the peri-implantation period. Annual Meeting for the Society for the Study of Reproduction, 2018.
35. Herring CM, Hu S, Bazer FW, Johnson GA, **Seo H**, Kramer AC, McLendon BA, Elmetwally M, Wu G. Dietary supplementation of 0.4% L-arginine between days 14 and 30 of gestation stimulates placental transport of water in gilts. Annual Meeting for the Society for the Study of Reproduction, 2018.
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