Dawn Renee Bresnahan

Associate Professor
Berry College

Animal Science
P.O. Box 495003
Mount Berry, GA 30149-5003
(706) 238-7873
dbresnahan@berry.edu

EDUCATION

2009-2014 **Post-Doctoral Fellow:** Reproductive Physiology, Embryology
Colorado State University
Fort Collins, CO

2003-2008 Degree: **Ph.D.**
Major: Veterinary Science, Reproductive Physiology
University of Kentucky
Lexington, KY

Dissertation: The Impact of Insulin on the Matrix Metalloproteinase (MMP) System During Equine Follicular Development and Atresia

2000-2003 Degree: **M.S.**
Major: Veterinary Science, Reproductive Physiology
University of Kentucky
Lexington, KY

Thesis: Development of a Model for Inducing Insulin Resistance in Mares: Implications Regarding the Duration of the Estrous Cycle

1996-2000 Degree: **B.S.A**
Major: Animal Science
University of Georgia
Athens, GA

CURRENT POSITION

2022 – present **Associate Professor, Department of Animal Science, Berry College, Mount Berry, GA**

Responsibilities:

Teaching and student advising

Teaching load: 18 contact hours/academic year

Academic Advising: 25-30+ undergraduates

Courses Taught
(2014-present)

- ANS 105, Introduction to Agricultural Sciences
- ANS 120, Introduction to Animal Science
- ANS 201, Orientation to Animal Sciences
- ANS 326, Anatomy and Physiology
- ANS 327, Reproductive Physiology
- ANS 441, Advanced Reproductive Technologies
- ANS 496, Academic Internship
- OHS 498, Special Topics: Cryopreservation of in vitro produced goat embryos
- BCC 100, First Year Seminar

PREVIOUS POSITIONS

2014 – 2022 **Assistant Professor, Berry College** Mount Berry, GA
Department of Animal Science

2009-2014 **Equine Reproduction Lab, Colorado State University** Fort Collins, CO
Postdoctoral Fellow

2008- 2009 **Palmetto Arabians, LLC** Timmonsville, SC
Assistant Breeding Manager

2000- 2008 **University of Kentucky-Department of Veterinary Science** Lexington, KY
Graduate Research Assistant

1997-2000 **University of Georgia –Veterinary Teaching Hospital** Athens, GA
Large Animal Medicine Technician
Small Animal Surgical Orderly
Small Animal Caretaker

PREVIOUS TEACHING

- Colorado State University Equine Reproduction Laboratory Short Courses – 2009-2014
- Colorado State University Equine Reproduction Laboratory Junior Practicum and Senior Rotations - 2009-2014
- Colorado State University BMS 642-Research Techniques for Gametes and Embryos – Guest lecturer
- Colorado State University ANEQ 440-Equine Industry and Issues - Guest lecturer
- Colorado State University BMS 680-Comparative Reproductive Physiology - Guest lecturer

PUBLICATIONS

Refereed Publications:

Submitted:

Published:

Bresnahan D. R, Catandi G. D., Peters S. O., Maclellan L. J., Broeckling C. D., Carnevale E. M. 2024. Maturation and culture affect the metabolomic profile of oocytes and follicular cells in young and old mares. Front. Cell Dev. Biol. 11:1280998. doi: 10.3389/fcell.2023.1280998

Catandi G. D., **Bresnahan D. R.,** Peters S. O., Fresa K. J., Maclellan L. J., Broeckling C. D., Carnevale E. M. 2023. Equine maternal aging affects the metabolomic profile of oocytes and follicular cells during different maturation time points. Front. Cell Dev. Biol. 11:1239154. doi: 10.3389/fcell.2023.1239154

Bresnahan D. R., Lupole R. E., Stilz C. R., Carnevale E. M. 2022. Maternal age is associated with decreased transcript abundance of connexins-37 and -43 and zona proteins in the mare. J Equine Vet Sci. Jan; 108:103796. doi: 10.1016/j.jevs.2021.103796.

Rossini J. B., Rodriguez J., **D. R. Bresnahan**, Stokes J. E., Carnevale E. M. 2019. Autogenous transfer of ICSI-produced equine embryos into oocyte donors' uteri during the same estrous cycle. *Reproduction, Fertility, and Development* 31(12):1912-1916. doi: 10.1071/RD19253.

Sessions-Bresnahan D. R., Heuberger A.L., Carnevale E. M. 2018. Obesity in mares promotes uterine inflammation and alters embryo lipid fingerprints and homeostasis. *Biology of Reproduction*, ioy107, https://doi.org/10.1093/biolre/ioy107

Carnevale E. M. and **Bresnahan D. R**. 2017. Effects of age and metabolic disease on the equine oocyte and embryo. Clinical Theriogenology 9(3):341-346.

Sessions-Bresnahan D. R., Schauer K. L., Heuberger A. L., Carnevale E. M. 2016. Effect of Obesity on the Preovulatory Follicle and Lipid Fingerprints of Equine Oocytes *Biol Reprod* 94 (1) 15, 1-12.

Sessions-Bresnahan D. R., Carnevale E. M. 2015. Age-associated alterations in granulosa cell transcript abundance in equine preovulatory follicles*. Reproduction, Fertility and Development*. 27:906-913.

Sessions-Bresnahan D. R., Graham J.K., Carnevale E. M. 2014. Validation of a heterologous fertilization assay and comparison of fertilization rates of equine oocytes using in vitro fertilization, perivitelline and intracytoplasmic sperm injections. *Theriogenology* 82:274-282.

Sessions-Bresnahan D. R., Carnevale E. M. 2014. The effect of equine metabolic syndrome on the ovarian follicular environment. *Journal of Animal Science* 92(4):1485-1494.

Carnevale E. M. and **D. R. Sessions.** 2012. *In vitro* production of equine embryos. *Journal of Equine Veterinary Science* 32(7):367-371.

Sessions D. R., Vick M. M., and Fitzgerald B. P. 2009. Characterization of Matrix Metalloproteinase-2 and -9 and their inhibitors in equine granulosa cells i*n vivo* and *in vitro. Journal of Animal Science* 87(12):3955-3966.

Vick M. M., Murphy B. A., **Sessions D. R.**, Reedy S. E., Kennedy E. L., Horohov D. W., Cook R. F., Fitzgerald B. P. 2008. Effects of systemic inflammation on insulin sensitivity in horses and inflammatory cytokine expression in adipose tissue. *American Journal of Veterinary Research* 69(1):130-9.

Murphy B. A. Elliott, J. A., **Sessions D. R.**, Vick M. M., Kennedy E. L., Fitzgerald B. P. 2007. Rapid phase adjustment of melatonin and core body temperature rhythms following a 6-h phase advance of the light/dark cycle in the horse. *Journal of Circadian Rhythms* 5:5.

Murphy B. A., Vick M. M., **Sessions D. R.**, Cook R. F., Fitzgerald B. P. 2007. Acute systemic inflammation transiently synchronizes clock gene expression in equine peripheral blood. *Brain Behav Immun* 21(4):467-76.

Vick M. M., Adams A. A., Murphy B. A., **Sessions D. R.**, Horohov D. W., Cook R. F., Sheldon B. J., Fitzgerald B. P. 2007. Relationship among inflammatory cytokines, obesity, and insulin sensitivity in the horse. *Journal of Animal Science* 85(5):1144-55.

Vick M. M., **Sessions D. R.**, Murphy B. A., Kennedy E. L., Reedy S. E., Fitzgerald B. P. 2006. Obesity is associated with altered metabolic and reproductive activity in the mare: Effects of Metformin on insulin sensitivity and reproductive cyclicity. *Reprod Fertil Dev* 18(6):609-17.

Murphy B. A., Vick M. M., **Sessions D. R.**, Cook R. F., Fitzgerald B. P. 2006. Evidence of an oscillating peripheral clock in an equine fibroblast cell line and adipose tissue, but not in peripheral blood. *Journal of Comparative Physiology A* 192(7):743-51.

Sessions D. R., Reedy S. E., Vick M. M., Murphy B. A., Fitzgerald B.P. 2004. Development of a model for inducing transient insulin resistance in the mare: Preliminary implications regarding the estrous cycle. *Journal of Animal Science* 82:2321-2328.

Fitzgerald B.P., Reedy S. E., **Sessions D. R.**, Powell D. M., McManus C. J. 2002. Potential signals mediating the maintenance of reproductive activity during the non-breeding season of the mare. *Reproduction Suppl*.59:115-129.

Powell D. M., Fitzgerald B. P., Reedy S. E., **Sessions D. R**. 2002. Effect of short-term exercise training on insulin sensitivity in obese and lean horses. *Equine Veterinary Journal* 34:81-84.

Non-refereed Publications:

Fitzgerald B. P., **Sessions D. R.**, Vick. M. M. Oct 2002. Insulin resistance in the horse: Significance and pharmacological management. *Equine Disease Quarterly* 11 (1): 4.

Abstracts:

Bresnahan D. R., Carnevale E. M. 2019**.** Culture of bovine oocytes and embryos with metabolic hormones concentrations associated with equine metabolic syndrome. The 45th Annual Conference of the International Embryo Technology Society. *Reproduction, Fertility and Development* 24 (1): 157. New Orleans, LA. Abstract 64.

*Stoltzfus M, Wayman J, Stilz R, and **Bresnahan D. R**. 2019. Sex ratio of *in vitro*-produced goat embryos. The 45th Annual Conference of the International Embryo Technology Society. *Reproduction, Fertility and Development* 24 (1): 197. New Orleans, LA. Abstract 144.

*Stilz CR, Stoltzfus M, Boyd B, and **Bresnahan D. R**. 2019. Use of stored zonae pellucidae from young and old mares to study sperm–oocyte binding. The 45th Annual Conference of the International Embryo Technology Society. *Reproduction, Fertility and Development* 24 (1): 209. New Orleans, LA. Abstract 169.

Sessions-Bresnahan D. R, Carnevale EM. 2014. Age-associated alterations in granulosa cell transcript abundance in equine preovulatory follicles. Havemeyer Symposia: Comparative Aspects of Reproductive Aging in the Mare and Woman. Estes Park, CO. October 10-12, 2014.

Sessions-Bresnahan, D. R., K. L. Schauer, A. L. Heuberger, J. E. Prenni, E. M. Carnevale. 2014. Alterations in the equine oocyte and follicle associated with obesity and metabolic syndrome. Eleventh International Symposium on Equine Reproduction. Hamilton, New Zealand. January 26-31.

Sessions-Bresnahan, D. R., K. L. Schauer, J. E. Prenni, E. M. Carnevale. 2013. Effect of short-term obesity on the follicular milieu and lipid fingerprint of individual mare oocytes. Forty-sixth Annual Meeting of the Society for the Study of Reproduction. Montreal, Canada. Abstract 564.

Sessions-Bresnahan, D. R., E.M. Carnevale. 2013. Altered gene expression in equine granulosa cells associated with aging. Colorado State University's 14th Annual College of Veterinary Medicine and Biomedical Sciences Research Day.

Sessions, D. R., E.M. Carnevale. 2012. Alterations in the ovarian follicle associated with equine metabolic syndrome. Forty-fifth Annual Meeting of the Society for the Study of Reproduction. State College, PA. Abstract 476.

Sessions, D. R., E.M. Carnevale. 2012. Effect of equine metabolic syndrome on the intrafollicular environment and fertility. Colorado State University's 13th Annual College of Veterinary Medicine and Biomedical Sciences Research Day.

Sessions, D. R., J.K. Graham, E.M. Carnevale. 2011. Comparison of fertilization rates of equine oocytes using in vitro fertilization, perivitelline and intracytoplasmic sperm injections. The 38th Annual Conference of the International Embryo Transfer Society. *Reproduction, Fertility and Development* 24 (1): 198-199. Pheonix, AZ. Abstract 173.

Carnevale, E. M., **D. R. Sessions,** J.E. Stokes, J.K. Graham. 2011. Comparison of fertilization methods with equine oocytes. Havemeyer Foundation Workshop: Equine *In Vitro* Fertilization. Hilton Head, SC

Sessions, D. R., J.K. Graham, E.M. Carnevale. 2011. Comparison of fertilization rates of equine oocytes using in vitro fertilization, perivitelline and intracytoplasmic sperm injections. The Rocky Mountain Reproductive Sciences Symposium.

da Silveira J.C., **D. R. Sessions**, D.N. Rao Veeramachaneni, Q.A. Winger, E.M. Carnevale, G. J. Bouma. 2011. MiRNAs within the ovarian follicle: Identification of cell-secreted vesicles as miRNA carriers. *Biol Reprod 85 (1 Supplement) 207.*

Sessions, D. R., J.C. Da Silveira, B.D.L. Rodrigues, Q.A. Winger, G.J. Bouma, and E.M. Carnevale. 2010. Effect of aging and oocyte maturity on mRNA content of maternal effect genes in the equine oocyte and early ICSI derived embryos. The Rocky Mountain Reproductive Sciences Symposium.

Sessions, D. R., J.C. Da Silveira, B.D.L. Rodrigues, Q.A. Winger, G.J. Bouma, and E.M. Carnevale. 2010. Effect of aging and oocyte maturity on mRNA content of maternal effect genes in the equine oocyte and early ICSI derived embryos. Colorado State University Biomedical Sciences Research Retreat.

Sessions, D. R., E. M. Woodward, B. P. Fitzgerald. 2010. Relationship between elevated insulin and matrix metalloproteinases-2 and -9 and their inhibitors in equine granulosa cells *in vivo.* The Tenth International Symposium on Equine Reproduction. *Animal Reproduction Science* 2010, Vol 121, Supplement 1-2. Abstract 40.

Fitzgerald, B. P., **Sessions, D. R.**, and Vick M. M. 2008. Obesity and reproduction in the mare. In: The chronically infertile mare (Abstract book). The Havemeyer Foundation: page 23.

Sessions, D. R., M. M. Vick, B. P. Fitzgerald. 2007. Expression of MMP-2, -9 and TIMP-2 in equine granulosa cells and the impact of elevated insulin *in vitro*. Fortieth Annual Meeting of the Society for the Study of Reproduction. Abstract 319.

Sessions, D. R., M. M. Vick, B. P. Fitzgerald. 2007. The effect of insulin on MMP and TIMP expression in equine granulosa cells. Nineteenth World Congress on Fertility and Sterility. POS-128. International Convention Center, Durban, South Africa.

Murphy, B. A., M. M Vick, **D. R. Sessions**, R. F. Cook, B. P. Fitzgerald. 2007. Molecular evidence of immune-circadian interaction in the horse. Program Number P602. San Diego, CA: Plant & Animal Genomes XV Conference.

Murphy B. A., M. M. Vick, **D. R. Sessions**, R. F. Cook, B. P. Fitzgerald. May 2006. Acute systemic inflammation induces upregulation of circadian clock genes Per2 and Bmal1 in equine peripheral blood. Proc Soc Res Biol Rhythms Tenth Mtg. Abstract 221. Destin, FL.

Murphy, B. A**.,** M. M. Vick, **D. R. Sessions**, R. F. Cook, B. P. Fitzgerald. 2006. Investigation of the equine molecular clock in a fibroblastic cell line, adipose tissue and peripheral blood. Program Number P600. San Diego, CA: Plant & Animal Genomes XIV Conference.

Vick, M. M., **D. R. Sessions**, B. A. Murphy, and B. P. Fitzgerald. Sept 2005. Inflammation, insulin resistance and laminitis: Does adipose tissue play a role? Waltham International Nutritional Sciences Symposium on Equine Laminitis. Omni Shorum Hotel, Washington D.C.

Murphy, B. A., R. F. Cook, M. M. Vick, **D. R. Sessions**, B. P. Fitzgerald. 2005. Oscillating expression of core clock genes in the horse. Program Number 60.15. Washington, DC: Society for Neurocience, 2005.

Kennedy, E. L., M. M. Vick, **D. R. Sessions**, S. E. Reedy, B. A. Murphy, and B. P. Fitzgerald. 2004. Administration of cortisol suppresses the preovulatory rise in LH but does not inhibit ovulation. *Biology of Reproduction Suppl.* 70 (1). Abstract 360.

Vick, M. M., **D. R. Sessions**, S. E. Reedy, B. A. Murphy, E. L. Kennedy, B. P. Fitzgerald. 2003. Development of a model for treating insulin resistance in mares. *Journal of Animal Science* 81 (Suppl. 1). Abstract 286.

Fitzgerald, B. P., S. E. Reedy, **D. R. Sessions**, M. M. Vick, B. A. Murphy. 2003. Obesity disrupts the duration of the estrous cycle in the mare. *Journal of Animal Science* 81 (Suppl. 1). Abstract 406.

Reedy, S. E., M. M. Vick, **D. R. Sessions**, B. A. Murphy, E. L. Kennedy, and B. P Fitzgerald. 2003. Induction of an inflammatory response by administration of lipopolysaccharide in the horse is unaccompanied by changes in leptin. *Biology of Reproduction Suppl.* 68 (1). Abstract 615.

Vick, M. M., S. E. Reedy, B. A. Murphy, **D. R. Sessions**, E. L. Kennedy, B. P. Fitzgerald. 2003. Induction of insulin resistance in the horse by administration of LPS: Possible role of TNF-α. *Biology of Reproduction Suppl* 68 (1). Abstract 614.

Sessions, D. R., S. E. Reedy, M. M. Vick, B. P. Fitzgerald. 2002. Development of a model for inducing insulin resistance in mares: Implications regarding the duration of the estrous cycle. Thirty-Fifth Annual Meeting of the Society for the Study of Reproduction. *Biology of Reproduction Suppl.* 66(1):339-340.

Powell, D. M., B. P. Fitzgerald, S. E. Reedy, **D. R. Sessions**. 2002. Effect of short-term exercise training on insulin sensitivity in obese and lean horses. *Sixth International Conference on Equine Exercise Physiology*.

Fitzgerald, B. P., D. M. Powell, S. E. Reedy, **D. R. Sessions**. 2001. Evidence that obesity and associated insulin resistance in mares does not account for the continuation of estrous cycles during the non-breeding season. *Biology of Reproduction Suppl.* 64(1). Abstract 626.

<u>student author</u>
*student presenter

PROFESSIONAL ORGANIZATIONS

- International Society of Wildlife Endocrinology
- International Embryo Technology Society
- Society for the Study of Reproduction
- American Society of Animal Science

AD HOC REVIEWER

- Journal of Equine Veterinary Science (2020)
- Animals (2020, 2021, 2023)
- PLosOne (2019)
- Georgia Journal of Science (2019)
- Biology of Reproduction (2018, 2021, 2022)
- Reproduction Fertility and Development (2014)
- Theriogenology (2012, 2018-2020, 2023)
- Animal Reproduction Science (2010)
- Journal of Animal Science (2007, 2008)

GRANTS AWARDED

- Berry College, Faculty Development Grant, "Determination of white-tailed deer estrous cycles via urine hormone analysis" (2022-2023, $3000)
- Berry College, School of Mathematics and Natural Sciences Development of Undergraduate Research Grant, "Development of staining techniques of sperm from white-tailed deer" (2022-2023, $822.16).
- Berry College, Faculty Development Grant, "Purchase of an iSperm mobile computer assisted sperm analyzer" (2021-2022, $2972)
- Berry College, School of Mathematics and Natural Sciences Development of Undergraduate Research Grant, "Purchase of a vapor shipper for several studies involving undergraduate students" (2021-2022, $1664).
- Berry College, Faculty Development Grant, "Purchase of statistical and graphing software" (2020-2021, $698)
- Berry College, School of Mathematics and Natural Sciences Development of Undergraduate Research Grant, "Establishment of cryopreservation techniques of epididymal spermatozoa for in vitro embryo production of White-Tailed Deer" and "Evaluation of cryopreservation techniques of in vitro produced white tail deer embryos" (2019-2020, $790.00).
- Berry College, Faculty Development Grant, "Evaluation of inflammation and oxidative stress in the ovarian follicles of mares fed a dietary supplement high in omega-3 fatty acids and antioxidants" (2019-2020, $3000).
- Berry College, School of Mathematics and Natural Sciences Development of Undergraduate Research Grant, "Evaluation of inflammation in the ovarian follicles of mares fed a dietary supplement high in omega-3 fatty acids and antioxidants" (2018-2019, $968.89).
- Berry College, Faculty Development Grant, "Preservation of goat and white-tail deer epididymal spermatozoa" (2018-2019, $2554)

- National Science Foundation Major Instrumentation Research Program, "Berry College MRI: Acquisition of a Flex Real-Time PCR System for Undergraduate Research and Teaching" (2018-2021, $99,645.08)
- Berry College, Summer Stipend, "Evaluation of cryopreservation methods and media additives on in vitro produced goat embryos" (2018, $5000)
- Berry College, School of Mathematics and Natural Sciences Development of Undergraduate Research Grant, "Comparison of sperm binding to oocytes from young and old mares" (2017-2018, $772)
- Berry College, School of Mathematics and Natural Sciences Development of Undergraduate Research Grant, "Evaluation of the capacity of horse spermatozoa to fertilize goat oocytes" (2016-2017, $972)
- Berry College, Faculty Development Grant, co-investigator with Dr. Sunday Peters, "Evaluation of cryopreservation techniques of in vitro produced goat embryos" (2016-2017, $5,975)
- College Research Council, co-investigator, "Effect of maternal obesity on metabolism, inflammation, and lipid homeostasis in equine uteri and blastocysts" (2013-2014, $13,600)
- National Institutes of Health Contraception and Infertility Loan Repayment Program Award, "The relationship between aging, inflammation, and metabolism and fertility" (2012-2014, $12,600)

AWARDS AND HONORS

- Member of Delta Epsilon Iota Academic Honor Society (2008-present)
- Graduate Research Assistantship, Department of Veterinary Science (2000-2008)
- Travel grants to present research at the Society for the Study of Reproduction and the International Federation of Fertility and Sterility conferences (2006)