

Alison F. (Greene) Ermisch, Ph.D.

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EDUCATION

- 2019-2024** **University of Nebraska-Lincoln (UNL), Lincoln, NE**
Doctor of Philosophy in Animal Science, Reproductive Physiology
Dissertation: "Impacts of Inflammation, Oxidative Stress, and the Microbiome on Ovarian Function and mRNA Metabolism During Oocyte Maturation and Early Embryo Development"
PI: Jennifer R. Wood, Ph.D.
- 2009-2013** **California Polytechnic State University (Cal Poly), San Luis Obispo, CA**
Bachelor of Science in Animal Science
Minor in Biological Sciences

POSITIONS

- 2024-present** **USDA-NIFA-AFRI Postdoctoral Fellow**
University of Nebraska-Lincoln, Lincoln, NE
- 2019-2024** **Graduate Research Assistant**
University of Nebraska-Lincoln, Lincoln, NE
- 2013-2018** **Research Embryologist**
Colorado Center for Reproductive Medicine, Lone Tree, CO
- 2013** **Research Fellow in Reproductive Sciences**
San Diego Zoo Institute for Conservation Research, Escondido, CA

AWARDS

- 2023-2024** Maude Hammond Fling Fellowship Award, UNL
- 2023** Margrave Agricultural Fund Fellowship Award, UNL
- 2023** Lalor Foundation Trainee Merit Award, Society for the Study of Reproduction
- 2023** Larrick Graduate Student Travel Award, UNL
- 2023** Trainee Poster Award (1st place), Molecular Mechanisms of Disease Symposium, UNL
- 2022** Widaman Distinguished Graduate Fellowship Award, UNL
- 2021** Trainee Travel Award, Society for the Study of Reproduction
- 2020** Arthaud Travel Award, Graduate Oral Presentation Competition (1st place), UNL

RESEARCH FUNDING

USDA-NIFA-AFRI Postdoctoral Fellowship (2024-67012-42025) – "*Regulation of mRNA methylation during bovine oocyte in vitro maturation.*" 06/01/2024-05/31/2026

PUBLICATIONS

Peer Reviewed Manuscripts

1. Pasquariello R, Zhang M, Herrick JR, **Ermisch AF**, Becker J, Schoolcraft WB, Barfield JP, Yuan Y, Krisher RL. **2023**. Lipid enriched reduced nutrient culture medium improves bovine blastocyst formation. *Reproduction and Fertility*. doi.org/10.1530/RAF-23-0057.

2. **Ermisch AF**, Bidne KL, Kurz SG, Bochantin KA, Wood JR. **2022**. Ovarian inflammation mediated by TLR-4 increased transcripts of maternal effect genes and decreased embryo development. *Biology of Reproduction*. doi.org/10.1093/biolre/ioac212.
3. Logsdon DM, **Ermisch AF**, Herrick JR, Becker J, Yao L, Broeckling C, Schoolcraft WB, Krisher RL. **2020**. Fatty acids present in commercial albumin preparations differentially affect pre- and peri-implantation development of murine embryos. *Fertility and Sterility*. doi.org/10.1016/j.xfss.2020.12.006
4. Herrick JR, Rajput S, Pasquariello R, **Ermisch A**, Santiquet N, Schoolcraft WB, Krisher RL. **2020**. Developmental and molecular response of bovine embryos to reduced nutrients in vitro. *Reproduction and Fertility*. doi.org/10.1530/RAF-20-0033
5. **Ermisch AF**, Herrick JR, Pasquariello R, Dyer MC, Lyons SM, Broeckling CD, Rajput SK, Schoolcraft WB, Krisher RL. **2020**. A novel culture medium with reduced nutrient concentrations supports the development and viability of mouse embryos. *Scientific Reports*. doi.org/10.1038/s41598-020-66019-4
6. Logsdon DM, **Ermisch AF**, Kile RA, Schoolcraft WB, Krisher RL, Yuan Y. **2020**. Egg cylinder development during in vitro extended embryo culture predicts the post transfer developmental potential of mouse blastocysts. *Journal of Assisted Reproduction and Genetics*. doi.org/1007/s10815-020-01714-9
7. Pasquariello R, **Ermisch A**, Silva E, McCormick S, Logsdon D, Barfield JP, Schoolcraft WB, Krisher RL. **2019**. Alterations in oocyte mitochondrial number and function are related to spindle defects and occur with maternal aging in mice and humans. *Biology of Reproduction*. doi.org/10.1093/biolre/iory248
8. Herrick JR, **Greene-Ermisch AF**, Schoolcraft WB, Krisher RL. **2018**. Exogenous growth factors do not affect the development of individually cultured murine embryos. *Journal of Assisted Reproduction and Genetics*. doi.org/10.1007/s10815-017-1103-3
9. Herrick JR, Lyons SM, **Greene-Ermisch, AF**, Broeckling CD, Schoolcraft, WB, Krisher RL. **2018**. A carnivore embryo's perspective on essential amino acids and ammonium in culture medium: effects on the development of feline embryos. *Biology of Reproduction*. doi.org/10.1093/biolre/iory122
10. Santiquet NW, **Greene AF**, Becker J, Barfield JP, Schoolcraft WB, Krisher RL. **2017**. A pre-in vitro maturation medium containing known cumulus oocyte complex ligand-receptor signaling molecules maintains meiotic arrest, supports the cumulus oocyte complex and improves oocyte developmental competence. *Molecular Human Reproduction*. doi.org/10.1093/molehr/gax032
11. Herrick JR, Lyons S, **Greene A**, Broeckling C, Schoolcraft, WB, Krisher RL. **2016**. Direct and osmolarity-dependent effects of glycine on preimplantation bovine embryos. *PLoS ONE* 11 (7): e0159581. doi.org/10.1371/journal.pone.0159581
12. Silva E, **Greene AF**, Strauss K, Herrick JR, Schoolcraft WB, Krisher RL. **2015**. Antioxidant supplementation during in vitro culture improves mitochondrial function and development of embryos from aged females. *Reproduction, Fertility, and Development*. doi.org/10.1071/RD14474

Book Chapters

1. **Ermisch AF** and Wood JR. **2024**. Regulation of Oocyte mRNA Metabolism: A Key Determinant of Oocyte Developmental Competence. In: Balboula, A.Z. (eds) Molecular Mechanisms Determining Mammalian Oocyte Quality. Advances in Anatomy, Embryology and Cell Biology, vol 238. doi.org/10.1007/978-3-031-55163-5_2

ORAL PRESENTATIONS

- 2023** **Ermisch AF**, Wood JR. N⁶-methyladenosine dynamics and differential methylation of maternal and zygotic mRNAs during the early stages of the maternal to zygotic transition. Society for the Study of Reproduction Annual Meeting, **Trainee Pre-Doctoral Platform Competition**. Ottawa, Canada.
- 2021** **Ermisch AF**, Bidne KL, Bochantin KA, Wood JR. Ovarian Inflammation Increases Oocyte Maternal mRNAs During Maturation and Alters Expression of Cumulus Regulatory Genes Resulting in Reduced Developmental Competence. Society for the Study of Reproduction Annual Meeting. St. Louis, MO.
- 2021** **Ermisch AF**, Bidne KL, Bochantin KA, Wood JR. Ovarian Inflammation Increases Oocyte Maternal mRNAs During Maturation and Alters Expression of Cumulus Regulatory Genes Resulting in Reduced Developmental Competence. Gilbert S. Greenwald Symposium on Reproduction. Virtual.
- 2020** **Ermisch AF**, Bidne KL, Wood JR. Increased Adiposity and Circulating Glucose Promote Pro-Inflammatory Signaling in The Cumulus Oocyte Complex of TLR4-Hyporesponsive Mice Fed A High Fat/High Sugar Diet. Flash Talk. Gilbert S. Greenwald Symposium on Reproduction. Virtual.
- 2019** **Ermisch AF**, Timme K, Wood JR. Oxidative Stress Alters the Expression Profile of Dppa3 in Oocytes and Decreases Di-Methylation of Histone H3K9 in the Pre-Implantation Embryo. Gilbert S. Greenwald Symposium on Reproduction. Kansas City, KS.
- 2017** **Greene-Ermisch AF**, McCormick S, Pasquariello R, Schoolcraft WB, Krisher RL. Mitochondrial function and localization in *in vitro* matured human oocytes is affected by maternal age and BMI. Society for the Study of Reproduction Annual Meeting. Washington, D.C.
- 2016** **Greene AF**, Herrick JR, Schoolcraft WB, Krisher RL. Excess provision of nutrients in culture medium reduces blastocyst quality. American Society for Reproductive Medicine Annual Meeting. Salt Lake City, UT.
- 2015** **Greene AF**, Herrick JF, Schoolcraft WB, Krisher RL. Significant reduction of nutrients in culture medium supports embryo development and improves cell allocation, suggesting improved viability. Society for the Study of Reproduction Annual Meeting. San Juan, Puerto Rico.

POSTER PRESENTATIONS AT NATIONAL & INTERNATIONAL MEETINGS

- 2024** **Ermisch AF**, Shao J, Beede K, Schmaltz R, Ramer-Tait A, Wood JR. Luteinizing Hormone Stimulation of Germ-Free and Conventionalized Female Mice Reveals Microbiome-Dependent Effect on Ovarian Steroidogenesis and Ovulation. Society for the Study of Reproduction Annual Meeting, Dublin, Ireland.
- 2024** **Ermisch AF**, Wood JR. Comparison of N⁶-methyladenosine modification of mRNA during the bovine and murine oocyte to embryo transition. International Embryo Technology Society Annual Meeting, Denver, CO.
- 2022** **Ermisch AF**, Wood JR. A novel combined fluorescence *in situ* hybridization and immunofluorescence technique allows for identification of mRNA and protein interactions in a single oocyte or embryo. Society for the Study of Reproduction Annual Meeting, Spokane, WA.

- 2020** **Ermisch AF**, Bidne KL, Wood JR. Increased adiposity and circulating glucose promote pro-inflammatory and immune cell signaling in the cumulus oocyte complex of TLR4-hyporesponsive mice fed a high fat/high sugar diet. Society for the Study of Reproduction Annual Meeting, Virtual.
- 2019** **Ermisch AF**, Timme K, Wood JR. Oxidative Stress Alters the Expression Profile of Dppa3 in Oocytes and Decreases Di-Methylation of Histone H3K9 in the Pre-Implantation Embryo. Society for the Study of Reproduction Annual Meeting. San Jose, CA.
- 2018** **Ermisch AF**, Logsdon DM, Schoolcraft WB, Yuan Y, Krisher RL. Commercial protein supplements significantly affect mouse embryo development and may impact blastocyst implantation potential. Annual Meeting of the American Society for Reproductive Medicine. Denver, CO.
- 2018** **Ermisch AF**, Logsdon DM, Schlenker TW, Hamm JM, McCormick S, Schoolcraft WB, Yuan Y, Krisher RL. A novel embryo culture system with reduced nutrients supports development of human 3pn embryos and extended embryo outgrowth. Annual Meeting of the American Society for Reproductive Medicine. Denver, CO.
- 2018** Pasquariello R, Herrick JR, Yuan Y, **Ermisch AF**, Becker J, Yao L, Broeckling C, Schoolcraft WB, Barfield JP, Krisher RL. Fatty Acid Supplementation in Culture Medium with Reduced Nutrient Concentrations Improves Bovine Blastocyst Development Compared with Standard Culture Medium. Annual Meeting of the International Embryo Transfer Society. Bangkok, Thailand.
- 2017** Pasquariello R, **Ermisch A**, McCormick S, Schoolcraft WB, Barfield JP, Krisher RL. Advanced Maternal Age Is Correlated with Elevated Mitochondrial DNA Copy Number in Mammalian Oocytes. Society for the Study of Reproduction Annual Meeting. Washington D.C.
- 2017** Herrick JR, **Ermisch AF**, Becker J, Schoolcraft WB, Krisher RL. How low can you go? Defining the minimal nutrient requirements for bovine embryos in culture. Annual Meeting of the International Embryo Transfer Society. Austin, TX.
- 2017** Krisher RL, Pasquariello R, **Ermisch A**, McCormick S, Schoolcraft WB. Mitochondrial function and mt-DNA content are associated with the poor quality of oocytes from patients of advanced maternal age. Annual Meeting of the American Society for Reproductive Medicine. San Antonio, TX.
- 2017** Pasquariello R, Badaoui B, **Ermisch A**, Paulson EE, McCormick S, Barfield JP, Schoolcraft WB, Ross PJ, Krisher RL. Micro-RNA sequencing of individual human oocytes. Annual Meeting of the American Society for Reproductive Medicine. San Antonio, TX.
- 2016** **Greene AF**, Herrick JR, Schoolcraft WB, Krisher RL. Can the embryo really choose? Impaired development with supplementation of non-essential amino acids in the first 48 hrs of mouse embryo culture in medium containing reduced nutrient concentrations. Society for the Study of Reproduction Annual Meeting. San Diego, CA.
- 2016** Herrick JR, Lyons SM, **Greene AF**, Broeckling CD, Schoolcraft WB, Krisher RL. Metabolic response of feline embryos to essential amino acids: a carnivore embryo's perspective on coping with metabolic ammonium in culture. Society for the Study of Reproduction Annual Meeting. San Diego, CA.
- 2016** Krisher RL, Herrick JR, **Greene AF**, Schoolcraft WB, Spate LD, Roberts RM, Yuan Y. Supplementation of growth factors during in vitro maturation improves oocyte developmental competence, although species differences exist. Society for the Study of Reproduction Annual Meeting. San Diego, CA.

- 2016** Santiquet NW, **Greene AF**, Barentsen KC, LaRocque KA, Schoolcraft WB, Barfield JP, Krisher RL. A physiological approach to meiotic arrest prior to in vitro maturation improves oocyte mitochondrial activity and subsequent embryo implantation. Society for the Study of Reproduction Annual Meeting. San Diego, CA.
- 2016** Herrick J, **Greene A**, Schoolcraft WB, Krisher RL. Role of polyamines in bovine pre-implantation development. Annual Meeting of the International Embryo Transfer Society. Louisville, KY.
- 2016** Krisher RL, Lyons S, **Greene A**, Stevens J, Herrick J, Kirkwood J, Prenni J, Broeckling C, Schoolcraft WB. A novel, highly sensitive tandem mass spectrometry metabolomics approach predicts outcome of poor-quality day 5 blastocysts. Annual Meeting of the American Society for Reproductive Medicine. Salt Lake City, UT.
- 2016** Schlenker R, **Greene A**, Lyons S, Stevens J, Herrick J, Prenni J, Kirkwood J, Broeckling C, Schoolcraft WB, Krisher RL. Blastocyst metabolism, as determined by a novel quantitative approach, is not impacted by chromosome complement or gender but is altered with maternal age. Annual Meeting of the American Society for Reproductive Medicine. Salt Lake City, UT.
- 2015** **Greene AF**, Herrick JR, Schoolcraft WB, Krisher RL. Significant reduction of nutrients in culture medium supports embryo development and improves cell allocation, suggesting improved viability. Society for the Study of Reproduction Annual Meeting. San Juan, Puerto Rico.
- 2015** Santiquet NW, **Greene AF**, Herrick JR, Giraldo AM, Schoolcraft WB, Barfield JP, Krisher RL. Developmental competence of bovine oocytes after 24 h in a meiotic arrest medium containing cAMP and cGMP modulators. Society for the Study of Reproduction Annual Meeting. San Juan, Puerto Rico.
- 2015** Krisher RL, Santiquet NW, LaRocque, **Greene A**, Schoolcraft W, Barfield. Twenty-four hours of oocyte meiotic arrest using cAMP/cGMP modulators does not compromise development or quality of mouse embryos following in vitro maturation. Society for the Study of Reproduction Annual Meeting. San Juan, Puerto Rico.
- 2015** Santiquet NW, **Greene AF**, Schoolcraft WB, Krisher RL. Pre-in vitro maturation with cyclic AMP and cyclic GMP modulators improves developmental competence of mouse oocytes. Annual Meeting of the International Embryo Transfer Society. Versailles, France.
- 2015** Krisher RL, Pospisil C, **Greene AF**, Stevens JM, Schoolcraft WB, Swain JE. Comparison of a benchtop incubator and a time lapse incubator for culture of human embryos: impact of culture dish. Annual Meeting of the American Society for Reproductive Medicine. Baltimore, MD.
- 2014** **Greene AF**, Schoolcraft WB, Krisher RL. Reducing culture volume is not advantageous to development of individually cultured mouse embryos in the EmbryoScope™, although source of zygote affects both development and timing. Society for the Study of Reproduction Annual Meeting. Grand Rapids, MI.
- 2014** Krisher RL, **Greene AF**, Stevens J, Heuberger AL, Schoolcraft WB. Elevated maternal BMI results in severely disrupted blastocyst metabolism. Annual Meeting of the American Society for Reproductive Medicine. Honolulu, HI.
- 2014** Krisher RL, **Greene AF**, Stevens J, Heuberger AL, Schoolcraft WB. Metabolomic profile of embryo culture medium on day 3 is associated with subsequent blastocyst development. Annual Meeting of the American Society for Reproductive Medicine. Honolulu, HI.

TEACHING EXPERIENCE

2024	Teaching Assistant for ANSCI 442/842: Endocrinology, UNL
2020	Teaching Assistant for ANSCI 441/841: New Techniques in Reproductive Biology, UNL
2013	Teaching Assistant for ASCI 406: Applied Animal Embryology and Assisted Reproduction, Cal Poly

PROFESSIONAL AFFILIATIONS

2024-present	Gamma Sigma Delta Honor Society
2023-present	International Embryo Technology Society (IETS)
2014-present	Society for the Study of Reproduction (SSR)
2016-2018	American Society for Reproductive Medicine (ASRM)

SERVICE

Scientific Societies and Meetings

2023-2025	Trainee Representative to the Board of Directors, SSR
2023	Trainee Forum Co-Coordinator, SSR Annual Meeting
2022	Trainee-Mentor Luncheon Advising Co-Coordinator, SSR Annual Meeting
2021	Trainee-Mentor Luncheon Co-Coordinator, SSR Annual Meeting
2020	Trainee-Mentor Virtual Roundtable Co-Coordinator, SSR Annual Meeting
2020	Gilbert S. Greenwald Symposium Trainee Committee
2019-present	Trainee Affairs Committee, SSR
2019, 2021	Trainee Volunteer, SSR Annual Meeting
2019-2020	Heritage Committee Trainee Representative, SSR
2019, 2021-2023	Session Co-Chair, SSR Annual Meeting
2017	Session Co-Chair, Rocky Mountain Reproductive Sciences Symposium

Service at the University of Nebraska-Lincoln

2022	Midwest ASAS Academic Quadrathlon Volunteer
2019	Midwest ASAS Academic Quadrathlon Volunteer
2019-present	Animal Science Graduate Student Association Vice President, 2023-2024