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Major Professor: Dr. Laura Hernandez

Degree Objective: Endocrinology and Reproductive Physiology

Background: BS Dairy Science and Life Sciences Communication, University of Wisconsin-Madison, Spring 2018

Current Research Project:

My research focuses on lactation and the long-term bone health of both the mother and the offspring when lactation is combined with the usage of the selective serotonin reuptake inhibitor (SSRI) fluoxetine (Prozac®). In all mammals, lactation is characterized by a serotonin-driven breakdown of bone tissue in order to supply sufficient calcium to the offspring and is thought to be restored after weaning. SSRIs have also been shown to decrease bone mineral density across all ages and sexes and are considered a risk for osteoporotic fractures. Previous work in our lab has shown a relationship between SSRI usage and the perpetuation of lactation-driven bone loss into adulthood, as well as a developmental impact on the bone growth of offspring exposed to fluoxetine *in utero* and during lactation. Currently, I use C57bl6/J wild type mice to study the long-term health effects on the bone of mice given fluoxetine during gestation, lactation, or both, as well as the effects on the bone health of the exposed offspring at weaning and into adulthood. Further, I am also investigating the possibility of a dietary intervention, folic acid supplementation, as a possible rescue of lactation-driven bone loss.

Publications:

Connelly, M.K., Weaver, S.R., Kuehnl, J.M., **Fricke, H.P.**, Klister, M. and Hernandez, L. (2021), Elevated serotonin coordinates mammary metabolism in dairy cows. *Physiological Reports*, 9: e14798.

Kuehnl, JM, Connelly, MK, Dzidic, A, LauberM, **Fricke, HP**, Klister, M, Olstad, E, Balbach, M, Timlin, E, Pszczolkowski, V, Crump, PM, Reinemann, DJ, & Hernandez, LL. (2020). Corrigendum: The effects of incomplete milking and increased milking frequency on milk production rate and milk composition. *Journal of Animal Science*, 98(3).

Carvalho, PD, Santos, VG, **Fricke, HP**, Hernandez, LL, & Fricke, PM. (2019). Effect of manipulating progesterone before timed artificial insemination on reproductive and endocrine outcomes in high-producing multiparous Holstein cows. *Journal of Dairy Science*, 102(8), 7509-7521.

Niles, AM, **Fricke, HP**, Carvalho, PD, Wiltbank, MC, Hernandez, LL, & Fricke, PM. (2019). Effect of treatment with human chorionic gonadotropin 7 days after artificial insemination or at the time of



embryo transfer on reproductive outcomes in nulliparous Holstein heifers. *Journal of dairy science*, 102(3), 2593-2606.

Weaver, SR, **Fricke, HP**, Xie, C, Aiello, RJ, Charles, JF, & Hernandez, LL. (2018). Peripartum dietary supplementation of a small-molecule inhibitor of tryptophan hydroxylase 1 compromises infant, but not maternal, bone. *American Journal of Physiology-Endocrinology and Metabolism*, 315(6), E1133.

Weaver, SR, **Fricke, HP**, Xie, C, Lipinski, RJ, Vezina, CM, Charles, JF, & Hernandez, LL. (2018). Peripartum fluoxetine reduces maternal trabecular bone after weaning and elevates mammary gland serotonin and PTHrP. *Endocrinology*, 159(8), 2850-2862.

National Presentations:

Poster presentation: **Fricke, HP**, Krajco, CJ, Sheftel, CM, Charles, JF, Hernandez, LL. (2021) Fluoxetine Administration During Lactation Impacts the Bone Health of the Dam and the Offspring in Mice. ENDO 2021. Virtual conference.

Poster presentation: **Fricke, HP**, Krajco, CJ, Sheftel, CM, Charles, JF, Hernandez, LL. (2020) Fluoxetine Exposure during the Peripartal Period Has Sex-Specific Impacts on Adult Bone Health in Mice. American Society for Bone and Mineral Research 2020. Virtual conference.

Poster presentation: **Fricke, HP**, Sheftel, CM, & Hernandez, LL. (2020). Fluoxetine Administration Influences Serotonin-Driven Bone Remodeling During Lactation and Pregnancy Outcome in Mice. ENDO 2020. Virtual conference.

Poster presentation: **Fricke, HP**, Weaver, SR, Hernandez, LL. (2018). Bone Remodeling Gene Expression is Dynamic Across Lactation in Response to Fluoxetine. Abstract presented at ENDO, 2018. Chicago, IL. *Abstract selected for poster award competition.

Poster presentation: **Fricke, HP**, Connelly, MK, Hernandez, LL. (2018). The role of serotonin in systemic immune response during mid-late lactation in dairy cows. Abstract presented at ADSA, 2018, Knoxville, TN.

Other Presentations:

Oral presentation: **Fricke, HP**, Hernandez, LL. (2020). Fluoxetine Usage during the Peripartal Period and the Long-Term Consequences on the Bone Health of the Dam and the Offspring. Presented at the UW-Madison Developmental Endocrinology Research Group, 2020. Virtual meeting.

Oral presentation: **Fricke, HP**, Sheftel, CM, Hernandez, LL. (2020). Fluoxetine Administration Impacts Serotonin-Driven Bone Remodeling During Lactation and Pregnancy Outcome in Mice. Abstract presented at the Endocrinology and Reproductive Physiology Symposium, 2020. Virtual meeting. *Selected for oral presentation award competition.

Poster presentation: **Fricke, HP**, Weaver, SR, Hernandez, LL. (2018). Bone Remodeling Gene Expression is Dynamic Across Lactation in Response to Fluoxetine. Abstract presented at the



Endocrinology and Reproductive Physiology Symposium, 2018. *Abstract selected for poster award competition.

Oral presentation: **Fricke, HP**, Hernandez, LL. (2018). Fluoxetine, Folic Acid, and Bone Remodeling During Lactation. Presented at the Developmental Endocrinology Cohort Meeting, 2018. Madison, WI.

Teaching and Mentorship:

Teaching Assistant

Animal Science/Dairy Science 373: Animal Physiology [Spring 2019]

Undergraduate Mentorship

Lauren Brettingen [2020-present]

Molly Perry [2020-present]

Chandler Krajco [2019-2020]