

Name: Adam Beard

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Major Professor: Dr. Milo Wiltbank; Department of Animal and Dairy Sciences

Degree Objective: PhD Endocrinology and Reproductive Physiology; Fall 2018-present

Background: BS Animal and Poultry Sciences, Virginia Tech, December 2017

Current Research Project:

My research focuses on the relationship between anti-Mullerian hormone (AMH) and the primordial follicles of the ovary (also known as the “ovarian reserve”). The primordial follicles remain dormant on the ovary until they are activated and later recruited to grow in a follicular wave. Studying ovarian follicle dynamics is simple in cows with the use of palpation and transrectal ultrasonography. The primordial follicles, however, are small and contain little to no fluid, thus cannot be seen via ultrasound. This makes it difficult to study the physiology of primordial follicles *in vivo*. The goal of my thesis is to develop the bovine as an *in vivo* model to study how the primordial follicles are regulated by AMH produced by the larger fluid-filled follicles. In order to do so, we will be looking at some of the known causes of follicle loss that lead to premature ovarian failure (POF), also known as early menopause. Although the primordial follicles cannot be seen on ultrasound, the dynamics of the visible antral follicles can serve as an indicator of what is happening on the ovary in this abnormal POF state. The questions we pursue will lend some understanding to previous work in agriculture and basic physiology of the ovary, as well as being translated to POF research in women.

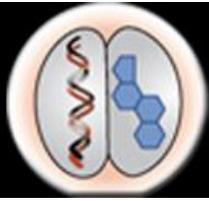
Most recently, I have characterized the anti-Mullerian hormone (AMH) and follicle stimulating hormone (FSH) profiles in plasma samples from neonatal Holstein calves. These animals were not challenged in any way, so the profiles are strictly physiologic. The first blood sample was taken within two hours after birth and the last sample was at around 100 days of age. The first month was sampled more frequently than the last two months as we were curious in this very early post-natal period. Samples were collected from singleton heifers, twin heifer pairs, and heifer/freemartin + bull twin pairs. The heifers are still in the herd and will likely be sampled at multiple other time points in their lifetime. As they become older, it will be easier to evaluate follicular activity on their ovaries via transrectal ultrasound imaging.

Future directions involve challenging or inducing the activation of primordial follicles through pharmacologic and/or surgical methods to better understand their biology. For our questions, studying pathophysiology may be an important tool for understanding normal physiology.

Honors:

Grants Received:

2018-2020 R25 Training, Education, And Mentoring in Science (TEAM-Science)



Publications:

Mezera, M., W. Li, A. Edwards, D. Koch, **A. Beard**, and M. Wiltbank. 2020. Identification of stable genes in the corpus luteum of lactating Holstein cows in pregnancy and luteolysis: Implications for selection of reverse-transcription quantitative PCR reference genes. *Journal of Dairy Science*. 103:4846–4857.

National Presentations:

Other Presentations:

Oral Presentation: Endocrinology and Reproductive Physiology Graduate Seminar (September 2019)

Poster Presentation (award finalist): Endocrinology and Reproductive Physiology Annual Research Symposium. “*Characterization of Follicle Stimulating Hormone Patterns from Serial Blood Samples of Neonatal Holstein Calves*”. (June 4, 2020)

Teaching and Mentorship:

Teaching:

TA for AnSci/DySci 373: Animal Physiology (Spring 2019 and 2020)

Gave lecture on muscle physiology to a class of 60 students. Lead bovine heart and lung dissections, as well as porcine kidney dissections. Assisted in the transition from in-person to remote teaching due to COVID-19.

TA for DySci 534: Reproductive Management of Dairy Cattle (Spring 2019 and 2020)

Lectured on ovarian physiology, taught students how to ultrasound ovaries, & lead a class experiment with the students.

Mentoring:

Hosted an undergraduate summer intern from Tuskegee University. (May – August 2019)

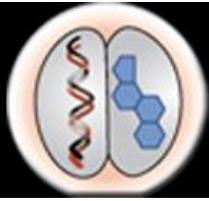
Assisted a sophomore student with a Biology 152 guided research experience. (February – May 2020)

ERP Service:

Recruitment Events 2019, 2020, and 2021

ERP Student Committee: Fall 2019 – present

social sub-committee



Other Service:

Animal Science Graduate Student Association: Spring 2019- present

Social/Fundraising Chair

Agriculture and Science Outreach:

Cows on the Concourse: June 2019

Introduced the Madison public to UW cows and calves on the Capitol Square.

Exploring Your Future: March 2019

Introduced middle school boys to careers in science; specifically, dairy science research.

Wisconsin Science Festival: October 2018