BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
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NAME	POSITION TITLE
Milo C. Wiltbank	Professor
eRA COMMONS USER NAME WILTBANK	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Brigham Young University	B.S.	1980	Zoology
Brigham Young University	M.S.	1982	Zoology/Physiology
University of Michigan	Ph.D.	1987	Physiology
Colorado State University	Post-doctoral	1987-1991	Reproductive Physiology

A. PERSONAL STATEMENT

My research has focused on mechanisms regulating ovarian function. I have utilized a number of animal models throughout my career. For the past 18 years I have done research on regulation of follicular growth with an emphasis on understanding the mechanisms involved in selection of single dominant follicle. The monovular bovine model has become the primary focus of this research program because of the quantity and quality of scientific research on follicular development in this animal model. My research has combined in vivo analysis of follicular dynamics and precise hormonal profiling with molecular analyses of gene expression including analysis of intracellular signal transduction pathways using cultured granulosa and thecal cells. This research has provided insights into the precise follicular dynamics, hormonal profiles, and gene expression changes that are associated with selection of a single dominant follicle. Manipulative studies have allowed development and testing of a working physiological model for selection of a single dominant follicle. For example, we have recently determined that LH pulses are critical for driving the increase in expression of LH receptor mRNA in granulosa cells at the time a single dominant follicle is selected. During the last 7 years we have researched the mechanistic alterations that result, at times, in selection of two or more dominant follicles, in the absence of exogenous hormonal treatments. The current research represents a joint effort by two complementary research programs focused on understanding the genetic and physiological basis for the increased ovulation rate in the Trio cattle family.

B. Positions and Honors:

1987-1991. Postdoctoral Fellow/Research Assistant Professor. Dept of Physiology, Colorado State Univ
1991-1997. Assistant Professor, Dairy Science Department and Endocrinology-Reproductive Physiology Program, University of Wisconsin-Madison. Appointment: 70% Research, 30% Teaching.
1997-2002. Associate Professor, Dairy Science Department and Endocrinology-Reproductive Physiology Program, University of Wisconsin-Madison. Appointment: 70% Research, 30% Teaching.
2002- Present. Professor, Dairy Science Department and Endocrinology-Reproductive Physiology Program, University of Wisconsin-Madison. Appointment: 70% Research, 30% Teaching.

Professional Memberships

Society for the Study of Reproduction.
American Dairy Science Association
American Animal Science Association

Service and Awards

New Investigator Award: First Place, Society for the Study of Reproduction, 1988.
John S. Donald Teaching Award, College of Agriculture and Life Sciences, Univ of Wisconsin, 1999.
NIH Reprod Endocrinology and Reproductive Biology Study Sections adhoc panel member, multiple years.
USDA Reproductive Biology Study Section panel member, multiple years.
Pharmacia Physiology Award, American Dairy Science Association, 2001.
Chair, Membership Committee, Society for the Study of Reproduction,2000-2002.
Director, Society for the Study of Reproduction, 2003-2006.
Standing Committee, Representative of USA to Int Congress on Animal Reproduction, 2004-Present.
WALSAA Outstanding Advisor Award. College of Ag and Life Sciences. Univ Wisconsin, 2005.
Research Award. National Association of Animal Breeders, 2006.
Service to Agriculture Award. Farm and Industry Short Course Alumni, 2007.
Merial Dairy Management Award. American Dairy Science Association, 2008.

B. Selected Peer-Reviewed Publications (out of total of 123):

1. Luo W, Gumen A, Haughian JM, Wiltbank MC, 2010. The role of Luteinizing Hormone in regulating gene expression during selection of a dominant follicle in cattle. Biology of Reproduction 2010 Oct 20. [Epub ahead of print] PMID: 20962252.

2. Diaz FJ, Luo W, Wiltbank MC, 2010. Effect of decreasing intraluteal progesterone on sensitivity of the early porcine corpus luteum to the luteolytic actions of prostaglandin F2α. *Biology of Reproduction* 2010 Aug 25. [Epub ahead of print] PMID: 20739670.

3. Piccinato CA, Sartori R, Sangsritavong S, Souza AH, Grummer RR, Luchini D, Wiltbank MC, 2010. In vitro and in vivo analysis of fatty acid effects on metabolism of 17beta-estradiol and progesterone in dairy cows. *Journal of Dairy Science* 93:1934-1943.

4. SartoriR, Bastos MR, Wiltbank MC, 2010. Factors affecting fertilization and early embryo quality in single- and superovulated dairy cattle. *Reproduction, Fertility and Development* 22:151-158.

5. Araujo RR, Ginther OJ, Ferreira JC, Palhao MM, Beg MA, Wiltbank MC, 2009. Role of follicular estradiol-17ß in determining the time of luteolysis in heifers. *Biology of Reproduction* 81:426-437.

6. Bamber RL, Shook GE, Wiltbank MC, Santos JE, Fricke PM, 2009. Genetic parameters for anovulation and pregnancy loss in dairy cattle. *Journal of Dairy Science* 92:5739-5753.

7. Checua CM, Beg MA, Gastal MO, Wiltbank M, Parrish JJ, Ginther OJ, 2009. Effect of suppression of FSH witha GnRH antagonist (acyline) before and during follicle deviation in the mare. *Reproduction in Domestic Animals* 44:504-511.

8. Wiltbank M, Lopez H, Sartori R, Sangsritavong S, Gumen A, 2006. Changes in reproductive physiology of lactating dairy cows due to elevated steroid metabolism. *Theriogenology* 65:17-29.

9. Luo W, Wiltbank MC, 2006. Distinct regulation by steroids of mRNAs for FSHR and CYP19A1 in bovine granulosa cells. *Biology of Reproduction* April 26 published ahead of print PMID 16641*47*

10. Gumen A, Wiltbank MC, 2005. Follicular cysts occur after a normal estradiol-induced GnRH/LH surge if the corpus hemorrhagicum is removed. *Reproduction* 129:737-745.

11. Diaz FJ, Wiltbank MC, 2005. Acquisition of luteolytic capacity involves differential regulation by prostaglandin F2α of genes involved in progesterone biosynthesis in the porcine corpus luteum. *Domestic Animal Endocrinology* 28:172-189.

12. Beg MA, Gastal EL, Gastal MO, Ji S, Wiltbank MC, Ginther OJ, 2005. Changes in steady-state concentrations of messenger ribonucleic acids in luteal tissue during prostaglandin F2 alpha-induced luteolysis in mares. Animal Reproduction Science 90:273-285.

13. Lopez H, Caraviello DZ, Satter LD, Fricke PM, Wiltbank MC, 2005. Relationship between level of milk production and multiple ovulations in lactating dairy cows. *Journal of Dairy Science* 88:2783-2793.

14. Lopez H, Sartori R, Wiltbank MC, 2005. Reproductive hormones and follicular growth during development of one or multiple dominant follicles. *Biology of Reproduction* 72:788-795.

15. Wiltbank MC, Fricke PM, Sangsritavong S, Sartori R, Ginther OJ, 2000. Mechanisms that prevent and produce double ovulations in dairy cattle. Journal of Dairy Science 83:2998-3007.

D. Current Research Support.

HATCH MULTI-STATE RESEARCH FORMULA FUND

Ovarian influences on embryonic survival in ruminants.

10/01/2007 - 9/30/2012

Wiltbank (PI)

The objective of this proposal is to determine the mechanisms that underlie reduced reproductive efficiency of ruminants and to develop methods to overcome these problems. My research has focused on reproductive efficiency in lactating dairy cows. During the last 2 years we have primarily focused on the role of progesterone in reduced reproductive efficiency. We have found that high progesterone during follicle growth prior to breeding can dramatically decrease double ovulation (~50%) and pregnancy losses (Day 32 to 56 after breeding, ~50%) and increase fertility (~1.4-fold). Reducing progesterone concentration near the time of AI had a minor effect on fertility (1.1-fold). A surprisingly minor effect of increasing progesterone after breeding was found (1.1-fold).

NIH

Defining the mechanisms involved in luteolysis.

6/1/2007 to 3/31/2011

Wiltbank (PI)

The objective of this research is to analyze the intracellular mechanisms involved in regression of the corpus luteum. The cow and pig are used as the research animal models. Our research has defined a set of genes that are regulated by prostaglandin F2a only in the corpus luteum that has the capacity to undergo luteolysis in response to prostaglandin F2a treatment (luteolytic capacity) and not in the corpus luteum without luteolytic capacity. These genes are regulated by specific transcription factors, with a particular role of the AP-1 transcription factor c-jun, that are only expressed in the corpus luteum with luteolytic capacity. A cell culture system has been developed in which granulosa cells are luteinized to large luteal cells and the in vivo changes in luteolytic capacity can be fairly reliably replicated in this in vitro system. This has allowed determination of the underlying signaling pathways, at least in large luteal cells, that lead to the development of luteolytic capacity.

USDA AFRI Integrated Solutions for Animal Agriculture (92620)

An integrated approach to improving dairy cow fertility.

10/1/2009 to 9/30/2013

Cabrera (PI)

Wiltbank (Collaborating PI)

The objective of this research is to determine the nutritional, disease, and management factors that are reducing dairy cow fertility. An extension program will be designed to integrate this research information in an economically useful program for dairy producers. This program will be used in reproductive management teams to improve reproduction on a group of dairy farms.