

**Psychology W3435
Neurobiology of Reproductive Behavior
Spring 2012**

Dr. Akshat Vyas
av2318@columbia.edu

PSYC W3435 Neurobiology of Reproductive Behavior (seminar)
4 pts Akshat Vyas Tuesday 10:10-12:00PM Room 405 Schermerhorn Hall
INSTRUCTOR PERMISSION REQUIRED PRIOR TO REGISTRATION

Please be advised that if you do not obtain permission to register from the instructor prior to registering you will not be permitted to take this course. Requests for permission should be made by email and it is recommended that you make this request in advance of the registration period.

Reproduction encompasses a broad range of behaviors in the life cycle of an organism from mate selection and copulation to parental care. These seminars will examine various aspects of reproduction across species and the neural mechanisms that regulate these behaviors and allow an organism to adapt to environmental change.

Textbook: Nelson, R.J. (2005) *An Introduction to Behavioral Endocrinology*. (3rd edition) Sinauer Associates Inc., Sunderland MA.

Weekly Schedule & Readings

Jan-17-12 Introduction & Overview

Nelson Chapters 1&2

Jan-24-11 Overview of Behavioral Endocrinology & Sexual Differentiation

Nelson Chapters 3&4

Wilson CA, Davies DC. (2007) The control of sexual differentiation of the reproductive system and brain. *Reproduction*. 133(2):331-59

Jan-31-12 Mate Selection & Sexual Orientation

Brennan PA, Kendrick KM. (2006) Mammalian social odours: attraction and individual recognition. *Philos Trans R Soc Lond B Biol Sci*. 361(1476):2061-78.

Yamazaki K, Beauchamp GK. (2007) Genetic basis for MHC-dependent mate choice. *Adv Genet*. 59:129-45.

Fisher HE, Aron A, Brown LL. (2006) Romantic love: a mammalian brain system for mate choice. *Philos Trans R Soc Lond B Biol Sci*. 361(1476):2173-86.

Rahman Q. (2007) The neurodevelopment of human sexual orientation. *Neurosci Biobehav Rev*. 29(7):1057-66.

Roselli CE, Resko JA, Stormshak F. (2002) Hormonal Influences on Sexual Partner Preference in Rams. *Archives of Sexual Behavior*. 31(1): 43-49

Bocklandt S, Vilain E. (2007) Sex differences in brain and behavior: hormones versus genes. *Adv Genet*. 59:245-66.

Feb-07-12 Journal Presentations

Feb-14-12 Sexual Behavior in Males & Females

Nelson Chapters 5&6

Crews D. (2005) Evolution of neuroendocrine mechanisms that regulate sexual behavior. *Trends Endocrinol Metab.* 16(8):354-61.

Dixson A. (2001) The evolution of neuroendocrine mechanisms regulating sexual behaviour in female primates. *Reprod Fertil Dev.* 13(7-8):599-607.

Feb-21-12 Pregnancy & Lactation

Brunton PJ, Russell JA. (2008) The expectant brain: adapting for motherhood. *Nat Rev Neurosci.* 9(1):11-25.

De Weerth C, Buitelaar JK. (2005) Physiological stress reactivity in human pregnancy—a review. *Neuroscience & Biobehavioral Reviews.* (2):295-312

Lonstein J. (2007) Regulation of anxiety during the postpartum period. *Frontiers in Neuroendocrinology.* 28: 115-141

Theodosia DT, Poulain DA. (2001) Maternity leads to morphological synaptic plasticity in the oxytocin system. *Progress in Brain Research.* 133: 49-58

Feb-28-12 Journal Presentations

Mar-06-12 MIDTERM EXAM

Mar-12-12 SPRING BREAK

Mar-20-12 Parental Behavior

Nelson, Chapter 7

Lévy F, Keller M, Poindron P. (2004) Olfactory regulation of maternal behavior in mammals. *Horm Behav.* 46(3):284-302.

Wynne-Edwards KE. (2001) Hormonal changes in mammalian fathers. *Horm Behav.* 40(2):139-45.

Wang Z, Aragona BJ. (2004) Neurochemical regulation of pair bonding in male prairie voles. *Physiol Behav.* 83(2):319-28.

Schradin C, Anzenberger G. (1999) Prolactin, the Hormone of Paternity. *News Physiol Sci.* 14:223-231.

Mar-27-12 Inheritance of Variations in Reproduction

Benoit D, Parker KC. (1994) Stability and transmission of attachment across three generations. *Child Dev.* 65(5):1444-56.

Champagne FA. (2008) Epigenetic mechanisms and the transgenerational effects of maternal care. *Front Neuroendocrinol.* 29(3):386-97.

Anway MD, Skinner MK. (2006) Epigenetic transgenerational actions of endocrine

disruptors. *Endocrinology*. 147(6 Suppl):S43-9.

Apr-03-12 Journal Presentations

Apr-10-12 Stress & Reproduction; Essay Presentations

Nelson Chapter 11

Wingfield JC, Sapolsky RM. (2003) Reproduction and resistance to stress: when and how. *J Neuroendocrinol*. 15(8):711-24.

Herrenkohl LR. (1986) Prenatal stress disrupts reproductive behavior and physiology in offspring. *Ann N Y Acad Sci*. 474:120-8.

Vrekoussis T, Kalantaridou SN, Mastorakos G, Zoumakis E, Makrigiannakis A, Syrrou M, Lavasidis LG, Relakis K, Chrousos GP. (2010) The role of stress in female reproduction and pregnancy: an update. *Ann N Y Acad Sci*. 1205:69-75.

Breen KM, Karsch FJ. (2006) New insights regarding glucocorticoids, stress and gonadotropin suppression. *Front Neuroendocrinol*. 27(2):233-45.

Apr-17-12 Environments, Aging, & Reproduction

Bhatt R. (2000) Environmental influence on reproductive health. *International Journal of Gynecology & Obstetrics*. 70(1): 69-75.

Klein SL, Nelson RJ. (1999) Influence of social factors on immune function and reproduction. *Rev Reprod*. 4(3):168-78.

Hijazi RA, Cunningham GR. (2005) Andropause: is androgen replacement therapy indicated for the aging male? *Annu Rev Med*. 56:117-37.

Chakraborty TR, Gore AC. (2004) Aging-related changes in ovarian hormones, their receptors, and neuroendocrine function. *Exp Biol Med (Maywood)*. 229(10):977-87.

Spencer RP. (2002) Cessation of reproduction: an analytic view of menopause. *Med Hypotheses*. 59(4):406-10.

Apr-24-12 Journal Presentations (last day of the class)

Course requirements

Each week, students will attend a two-hour seminar. Class time will be devoted to the presentation and discussion of book chapters and journal articles. The reading is intended to provide background knowledge on the relevant topics, to cover current research on those topics, and to serve as a stimulus for discussion. Students will prepare and present seminars on journal articles relevant to the course. The participation grade will be based on the quality of these presentations (organization, content) and on active involvement in class discussions.

The students take a written midterm exam (March 6, 2012) with short-answer/essay questions covering the material in the textbook, readings, and seminars. During the second half of the semester, the students write a term paper. The 8-10 page paper should take the form of a critical review paper that addresses a specific question related to the topics of the seminar. Essays are due on April 17, 2012

Grading is allocated as follows:

Midterm exam 20%

Essay 30%

Participation and Presentations 50%

Important Dates : March 6, 2012 MIDTERM EXAM

April 17, 2012 ESSAY DUE DATE