ANS 6313 Current Concepts in Reproductive Biology
Fall 2019

Frequency of Offering
Odd years, fall semester.

Instructor
P.J. Hansen, Dept. of Animal Sciences
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Purpose
This course uses in-depth discussion of recent review articles and original research publications on controversial or cutting-edge topics in reproductive biology to provide students with opportunities to 1) become aware of recent developments in reproductive biology, 2) develop critical thinking skills and 3) formulate theoretical models to underpin development of research programs. The course is designed for advanced students in reproductive biology and other biosciences.

Requirements
Consent of instructor is required and enrollment will be limited. Extensive experience in reproductive biology or a formal course in reproduction is required. It is strongly recommended that students have completed a course in molecular biology or cell biology.

Course Format
The course meets for 2 hours once weekly. Before class, students are assigned readings consisting of 2 review articles assigned by the instructor and one original research paper chosen by the students. The first hour of the class is taken up with a general discussion of the concepts illustrated in the review articles. The original research paper is evaluated in the second hour in a discussion. Each class period, one student will be assigned to choose the research paper and lead the discussion on the paper.

Time and Place
Usually, Tuesday, 5:00-7:00 PM, Room 102 Bldg 499 (L.E. "Red" Larson Dairy Science Building) although there will be meetings on other dates.

Presentations
The discussion on the review papers will be lead by Dr. Hansen but students will be given an opportunity for shaping the direction of the discussion. Discussion topics will involve (but not be limited to) the following:

--Development of models to organize concepts
--Critical evaluation of concept
--Clarification of confusing areas/concepts
--Critical evaluation experiments on which concepts are based
--Implications for other areas of reproductive biology
--Areas for future research

The research paper will be chosen by the student assigned to that topic. The paper should be a recent paper (2016-2017) that represents a key paper in the progress in that area of research. The student assigned to the paper should distribute the paper to each of the students in the lab one week before class meets. The discussion of the paper will be informal (i.e., without lots of overheads or powerpoint slides) and will focus on the following: The hypothesis, experimental design, results obtained, and significance of the results. All students will be expected to be involved in the discussion of the research paper.

Readings

Readings can be found in the electronic journal section of the University of Florida Health Science Library. In addition, Dr. Hansen will email the pdf file for each paper before class. It is expected that all students will have read every article.

For original research papers, the student assigned to find a paper should distribute the paper to each of the students in the lab one week before class meets. Distribution should be via email of the pdf file.

Grades and Grade Points

Grading is based on attendance (50%) and participation (50%). The highest grade possible for a student missing two lectures is a B+ and, for a student missing three lectures, is a B. Any student missing four or more lectures will be given an incomplete grade.

For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Communication About The Class

Email will be used as the major method for communicating when not in class. Therefore, provide Dr. Hansen with your email address if one is available. Dr. Hansen's email is hansen@animal.ufl.edu

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "*We, the members of the University of Florida*

community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "*On my honor, I have neither given nor received unauthorized aid in doing this assignment*."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php.

Software Use:

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,* www.counseling.ufl.edu/cwc/
  - Counseling Services
  - Groups and Workshops
  - Outreach and Consultation
  - Self-Help Library
  - Training Programs
  - Community Provider Database

- *Career Resource Center,* First Floor JWRU, 392-1601, www.crc.ufl.edu/

Services for Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

CLASS SCHEDULE

Aug 21 Organizational Session

Sept 3 Primordial Follicle Activation

Bertoldo MJ, Walters KA, Ledger WL, Gilchrist RB, Mermillod P, Locatelli Y. In-vitro regulation of primordial follicle activation: challenges for fertility preservation strategies. Reprod Biomed Online. 2018; 36:491-499.

Ford E, Beckett EL, Roman S, McLaughlin EA, Sutherland J. Advances in human primordial follicle activation and premature ovarian insufficiency. Reproduction. 2019: REP-19-0201.R2.

Sept 10 Follicular Growth

Chang HM, Wu HC, Sun ZG, Lian F, Leung PCK. Neurotrophins and glial cell line-derived neurotrophic factor in the ovary: physiological and pathophysiological implications. Hum Reprod Update. 2019;25:224-242.

Mazerbourg S, Monget P. Insulin-like growth factor binding proteins and IGFBP proteases: A dynamic system regulating the ovarian folliculogenesis. Front Endocrinol (Lausanne). 2018;9:134.

September 18 Spermatagonial Stem Cells

Mäkelä JA, Hobbs RM. Molecular regulation of spermatogonial stem cell renewal and differentiation. Reproduction. 2019 Jun 1. pii: REP-18-0476.R2.

Giassetti MI, Ciccarelli M, Oatley JM. Spermatogonial stem cell transplantation: insights and outlook for domestic animals. Annu Rev Anim Biosci. 2019;7:385-401.

September 24 The Oocyte at Ovulation

Camaioni A, Klinger FG, Campagnolo L, Salustri A. The Influence of pentraxin 3 on the ovarian function and its impact on fertility. Front Immunol. 2018; 9:2808.

Richani D, Gilchrist RB. The epidermal growth factor network: role in oocyte growth, maturation and developmental competence. Hum Reprod Update 2018;24:1-14.

October 1 Paternal Epigenetic Inheritance

Gòdia M, Swanson G, Krawetz SA. A history of why fathers' RNA matters. Biol Reprod. 2018;99:147-159.

Dupont C, Kappeler L, Saget S, Grandjean V, Lévy R. Role of miRNA in the transmission of metabolic diseases associated with paternal diet-induced obesity. Front Genet. 2019; 10:337.

October 15 Role of Seminal Plasma

Druart X, Rickard JP, Tsikis G, de Graaf SP. Seminal plasma proteins as markers of sperm fertility. Theriogenology. 2019;137:30-35.

Morgan HL, Watkins AJ. The influence of seminal plasma on offspring development and health. Semin Cell Dev Biol. 2019; in press.

October 22 New Concepts on Development of the Endometrium

Santamaria X, Mas A, Cervelló I, Taylor H, Simon C. Uterine stem cells: from basic research to advanced cell therapies. Hum Reprod Update. 2018; 24:673-693.

Bagnell CA, Bartol FF. Relaxin and the 'Milky Way': The lactocrine hypothesis and maternal programming of development. Mol Cell Endocrinol. 2019;487:18-23.

October 29 Embryonic Genome Activation

Eckersley-Maslin MA, Alda-Catalinas C, Reik W. Dynamics of the epigenetic landscape during the maternal-to-zygotic transition. Nat Rev Mol Cell Biol. 2018;19:436-450.

Sha QQ, Zhang J, Fan HY. A story of birth and death: mRNA translation and clearance at the onset of Maternal-to-Zygotic transition in mammals. Biol Reprod. 2019; in press.

November 5 Differentiation of Trophectoderm and Primitive Endoderm in the Blastocyst

Saini D, Yamanaka Y. Cell Polarity-dependent regulation of cell allocation and the first lineage specification in the preimplantation mouse embryo. Curr Top Dev Biol 2018;128:11-35.

Bassalert C, Valverde-Estrella L, Chazaud C. Primitive endoderm differentiation: from specification to epithelialization. Curr Top Dev Biol 2018; 128: 81-105.

November 12 Species Divergence in the Patterns of Preimplantation Development

Piliszek A, Madeja ZE. Pre-implantation development of domestic animals. Curr Top Dev Biol 2018; 268-294.

Wamaitha SE, Niakan KK. Human pre-gastrulation development. Curr Top Dev Biol 2018; 128: 295-338

November 19 Development of the Placenta

Knöfler M, Haider S, Saleh L, Pollheimer J, Gamage TKJB, James J. Human placenta and trophoblast development: key molecular mechanisms and model systems. Cell Mol Life Sci. 2019; in press.

Boss AL, Chamley LW, James JL. Placental formation in early pregnancy: how is the centre of the placenta made? Hum Reprod Update. 2018 Nov 1;24(6):750-760.

November 25 Regulation of GnRH pulse generation

Herbison AE. The Gonadotropin-releasing hormone pulse generator. Endocrinology. 2018; 159:3723-3736.

Scott CJ, Rose JL, Gunn AJ, McGrath BM. Kisspeptin and the regulation of the reproductive axis in domestic animals. J Endocrinol. 2018; in press.

December 3 Nutrition and Puberty

Manfredi-Lozano M, Roa J, Tena-Sempere M. Connecting metabolism and gonadal function: Novel central neuropeptide pathways involved in the metabolic control of puberty and fertility. Front Neuroendocrinol. 2018;48:37-49.

D'Occhio MJ, Baruselli PS, Campanile G. Influence of nutrition, body condition, and metabolic status on reproduction in female beef cattle: A review. Theriogenology. 2019; 125:277-284.