

Biochemical regulation of Physiological Processes Advanced Topics in Endocrinology

**BIOM*6570
Fall 2012**

Timetable

Lectures: Time - 2.30-3.20 pm; Monday, Wednesday & Friday
Place - ANNU, Room 156
Seminars/tutorials Tuesday 11am-1pm OVC 2633

Co-ordinator: N J MacLusky
Room 2633 Biomedical Sciences
Ext 54700
nmaclusk@uoguelph.ca

Additional Instructors:

Dr. Ian McPhee
Family practitioner and City Coroner
City of Guelph

Dr. Pavneesh Madan
Room OVC 3605 Biomedical Sciences
pmadan@uoguelph.ca

Dr. James Petrik
Room OVC 3627 Biomedical Sciences
jpetrik@uoguelph.ca

Dr. R. Moorehead
Room OVC 3626 Biomedical Sciences
rmoorehe@uoguelph.ca

Course Graduate Teaching Assistant:

Ari Mendell
amendell@uoguelph.ca

Course and learning objectives:

The course is intended for senior students who have a strong background in physiology (at a minimum Mammalian Physiology BIOM*3100/3110 or the new one-semester doubled weighted version, BIOM*3200). The majority of lectures in the course will be taught by the course coordinator, with a few guest lecturers contributing specific topics in endocrinology that are relevant to their particular areas of expertise and research interests.

The course will focus primarily on human endocrinology, with some consideration of both animal models in endocrine research and parallels between human medicine and veterinary clinical practice using the expertise available in the Ontario Veterinary College. The lectures will deal with the investigational methods that are used in endocrine research, the mode of action of hormones, the intracellular signaling pathways of target cells, aspects of hormone synthesis and secretion and the main regulatory functions of the hormones. The course will emphasize the integrative nature of hormone action in the regulation of processes such as metabolic control, growth and reproduction. Much of basic endocrinology taught in B.Sc. courses treats hormones and their actions individually, as if any given hormone is produced and acts in isolation, independently of other physiological processes. In reality, of course, endocrinology involves considerable “cross talk” between hormonal signaling pathways, so that the actions of different hormones are integrated and coordinated.

The course will not attempt to cover all aspects of the growing field of endocrinology. Rather, it will focus on specific underlying concepts and use examples to illustrate the broader implications of hormonal control of physiological events, including consideration of how endocrine problems can contribute to many common human disease states. As a graduate course, the emphasis is on learning objectives and class activities that test “real world” skills, using many of the same approaches that we use in graduate courses in Biomedical Sciences: group work in the development of presentations based on the scientific literature, as well as scenario-based take-home individual writing assignments..

Course text:

Textbook of Endocrine Physiology (5th Edition) 2004.
Edited by JE Griffin and SR Ojeda.
Oxford University Press

The textbook is recommended, BUT NOT REQUIRED. The essential material covered in each lecture will be included in the lecture notes posted to D2L, so it should be possible for students to complete the course and do well without purchasing a text book. However, the text book does provide a good, fairly concise and inexpensive (currently around \$50 Canadian from Amazon.ca or Chapters) paperback summary of endocrinology (with particular strengths in Reproductive Endocrinology) which can be useful for both background reading and as a resource if you continue in future to graduate/professional training in Endocrinology.

Prior experience has shown that reserve materials were not well used, and therefore no material has been put on reserve. However, the following provides the access numbers for textbooks that might be useful.

- Textbook of Endocrine Physiology (4th Edition) 2000.
JE Griffin and SR Ojeda [QP 187.T43]
- Endocrine Physiology 2000. B Kacsoh [QP 187.3P49.K33]
- Basic and Clinical Endocrinology 2001.
FS Greenspan, GJ Strewler [RC 648.B27.2001]

Evaluation of performance in the course:

- The course shares lectures with BIOM*4030 (the B.Sc. Endocrine Physiology course; see timetable, below) but has additional components in terms of seminars and written assignments that are specific to the graduate course. Performance in the course will be evaluated on the basis of these graduate specific components.

Each week, students will be asked to present papers selected from the area under discussion for that week. As part of the preparation for the paper presentations, the presenting student should prepare a one page (double sided) summary of the major points of the paper and his/her critique. All students should read the papers and come to class prepared: the students presenting the papers will be leading the discussion, but they should not be expected to cover everything by themselves. Graduate courses should represent GROUP LEARNING experiences.

All students will also be expected to submit a review paper on a subject of their choice, the only proviso being that it must be within the field of Endocrinology and Metabolism. This paper should follow the structure and guidelines of short published reviews in a current Endocrinology journal (such as Trends in Endocrinology and Metabolism). Students are encouraged to put together draft outlines of their reviews early in the course and get feedback from the coordinator, well ahead of the deadline for final submission of the reviews. Topics that are too broad or too narrow in their focus make it difficult or impossible to write a good review paper on them, so getting advice early, and often, is the key to success. The draft outline will count for 10% of the course mark, the final paper for 40%

Course evaluation:

All students will be scheduled to present papers three times during the course, each presentation and summary being graded by the coordinator (for a total of 50% of the course grade). The final review paper (worth 50% of the course grade, 10% for the draft outline, 40% for the paper) must be handed in within one week of the end of the course, to allow grading before the marks are due at the end of the university Fall semester exam period.

Learning objectives:

The overall learning objectives of the University can be found in the University of Guelph calendar (http://www.uoguelph.ca/undergrad_calendar/05-06). Please note the section on plagiarism. Although the course is based in part on group assignments and there is nothing wrong with doing research in groups on the assignment questions, the written reports MUST be your own, individual work. It is completely inadmissible to submit someone else's written work under your own name. For this reason, in the posters, the oral in-class presentations as well as in the take-home assignments, if you cite statements or results from other people, you must indicate the original source and cite it in your reference list.

The overall learning objective of this course is to gain an appreciation of how the rapid increases in our understanding of endocrinology that have taken place over the last 20-30 years are now being applied in developing new approaches to the management of disease. By the end of the course, students should be able to use their basic knowledge of endocrinology as a foundation for independent research, to develop an understanding of the subject that can be used to inform others, as well as to solve endocrine-related problems. In all the components of the course – the take home assignments, as well as the presentations – the emphasis is on students being able to express themselves individually while exploring their own interests and abilities, rather than following a rigid formula. The only constraint is that there must have a clear link to Endocrinology, but within this overall framework there is considerable latitude for students to approach the tasks in the course creatively and flexibly, using whatever approach works best.

Academic Integrity:

The University of Guelph takes a very serious view of Academic Misconduct. Included in this category are such activities as cheating on examinations, plagiarism, misrepresentation, and submitting the same material in two different courses without written permission. Students are expected to be familiar with the section on Academic Misconduct in the Graduate Calendar and should be aware that expulsion from the University is a possible penalty.

Accommodations for students with disabilities:

In compliance with university policy, the course coordinator is available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations are to be made on the first day of classes so that arrangements can be made. Students should register with the Centre for Students with Disabilities to verify their eligibility for appropriate accommodations. It is the responsibility of the student to arrange these accommodations with the Centre for Students with Disabilities well in advance of the deadline dates for the course assignments.

COURSE OUTLINE

Lecture #	Date	Subject	Instructor
1	Fri. Sept 6	General introduction to the course • Scope & goals of the course • Examinations, assignments	MacLusky
2	Mon. Sept 9	TRH-TSH-thyroid gland axis I	MacLusky
3	Wed. Sept 11	TRH-TSH-thyroid gland axis II	MacLusky
4	Fri. Sept 13	CRF-ACTH-adrenal axis I	MacLusky
5	Mon. Sept 16	CRF-ACTH-adrenal axis II	MacLusky
6	Wed. Sept 18	The GnRH-LH/FSH-gonadal axis	MacLusky
7	Fri. Sept 20	Steroid metabolism, transport and action	MacLusky
8	Mon. Sept 23	Puberty	MacLusky
9	Wed. Sept 25	The male reproductive system	MacLusky
10	Fri. Sept 27	Female reproduction: the ovarian cycle I	MacLusky
11	Mon. Sept 30	Female reproduction: the ovarian cycle II	MacLusky
12	Wed. Oct 2	Pregnancy, parturition and lactation	MacLusky
13	Fri. Oct 4	Non-reproductive effects of gonadal steroids 1	MacLusky
14	Mon. Oct 7	Non-reproductive effects of gonadal steroids 2	MacLusky
15	Wed. Oct 9	The incretins: new treatments for type II diabetes	MacLusky
16	Fri. Oct 11	Intestinal and fat hormones: integration of appetite, energy balance and stress	MacLusky
	Mon. Oct 14	Thanksgiving – no class	
17	Wed. Oct 16	Developmental Programming of Disease	MacLusky
18	Fri. Oct 18	Hormonal control of angiogenesis	Petrik
19	Mon. Oct 21	Endocrine disruptors in the Environment	Petrik

Lecture #	Date	Subject	Instructor
20	Wed. Oct 23	Clinical applications of Endocrinology I	MacLusky
21	Fri. Oct 25	Clinical applications of Endocrinology II	MacLusky
22	Mon. Oct 28	Endocrine related diseases I	Petrik
23	Wed. Oct 30	Endocrine related diseases II	Petrik
24	Fri. Nov 1	New Frontiers in Endocrine Research I	MacLusky
25	Mon. Nov 4	New Frontiers in Endocrine Research II	MacLusky
26	Wed. Nov 6	Clinical aspects: Veterinary Endocrinology	Madan
27	Fri. Nov 8	Clinical aspects: Endocrinology in Family Practice	McPhee
	Mon. Nov 11	Student Presentations I	All
	Wed. Nov 13	Student Presentations II	All
	Fri. Nov 15	Student Presentations III	All
	Mon. Nov 18	Student Presentations IV	All
	Wed. Nov 20	Student Presentations V	All
	Fri. Nov 22	Student Presentations VI	All
	Mon. Nov 25	Student Presentations VII	All
		Final assignments due Friday Dec 13 4:30pm	All