

ADVANCED ENDOCRINOLOGY

EXMD 502

General Information

Course #	EXMD 502
Term	Fall
Year	2022
Course schedule (day/time of class)	Mondays and Wednesdays, 4:35 pm to 5:55 pm
Number of credits	3
Course location	Burnside Hall 708
Course format	In person

Instructor Information

Name / Title	Professor Andrew Bateman / Professor Maia Kokoeva
E-mail	Andrew.bateman@mcgill.ca and maia.kokoeva@mcgill.ca
Telephone number for office appointments	<i>Dr. Bateman:</i> 514-934-1934 x35833 <i>Dr. Kokoeva:</i> 514-934-1934 x35360
Office hours for students	Upon e-mail request
Office location	MUHC-RI Glen Site, E Block Building, Room EM2.3220 (A. Bateman) or Room E02.7218 (M. Kokoeva)

Student Affairs Coordinator

Name	Maryam Khodary
E-mail	Expmedcasual.medicine@mcgill.ca
Telephone number for office appointments	514-934-1934 x 61859 currently working remotely please contact via email until further notice

Course Overview / General Information

Together ExMD 502 and 503 cover a study of hormonal signaling mechanisms, pancreatic hormones, gut hormones, thyroid, parathyroid hormones, neuroendocrinology, steroids, and growth factors. In addition, the role of hormones and growth factors in metabolism, reproduction and fetal maturation will be discussed. *Exmd 503 focuses on metabolism and nutrition, development, reproduction, bone and endocrine aspects of cancer*

The two courses, EXMD 502 and EXMD 503, are designed as a single course to give a basic foundation in the understanding of endocrine systems. The course is open to graduate students and U3 level undergraduate students. Although no assumptions are made that the students have studied endocrinology previously, they are expected to be familiar with certain biochemical and physiological principles.

The logical sequence for the course is the first part (EXMD 502) followed by the second part (EXMD 503). *It is possible* to take either course independently for students that have previously taken a course in endocrinology or cell signaling. When in doubt, students should consult Dr. Andrew Bateman or Dr. Maia Kokoeva, the Course Coordinators.

In accordance with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or French any written work that is to be graded.

Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue).

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/integrity for more information).

L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site <http://www.mcgill.ca/secretariat/policies/students/handbook-student-rights-and-responsibilitiesle-recueil-des-droits-et-obligations-d>

Office Hours

Dr. Bateman and Dr. Kokoeva's offices are located at the Glen Site (McGill University Health Centre). A student wishing to meet the course coordinators or any other lecturing professor may do so during office hours but it is advisable that they contact the professor beforehand. Phone numbers and e-mails can be obtained *as per above*.

Schedule / Instructional Method

The course takes place Mondays and Wednesdays from 4:35 pm to 5:55 pm, unless otherwise indicated by the Course Coordinators and/or Student Affairs Coordinator.

Students are urged to be punctual so that all of the material can be given in the scheduled time, thus eliminating the necessity of having extended lectures. Lecturers will be available for consultation outside the lecture hours.

Lectures will be carried out with the projection of PowerPoint presentation slides as a visual tool in the learning process. Additionally, there will be a Student Seminar organized in the latter half of the course (more details to follow).

MyCourses will be used as a tool for the collection of term papers.

Required Course Materials

No specific textbook is used for the course.

Standard endocrinology texts such as *Textbook of Endocrinology* (Williams) and *Endocrinology* (de Groot) are recommended for background reading. Copies can be found in the reference sections of the McIntyre Medical Library and in the medical libraries of the various teaching hospitals.

Each lecturer will give you specific references. Handouts/lecture notes will be posted weekly on MyCourses website.

The books listed above are general texts which will be useful for most cases.

Optional Course Materials

Not Applicable.

Course Content / Important Dates / Grading

EXMD 502 will cover topics on metabolism and nutrition, development, reproduction, and the

endocrine aspects of cancer. Emphasis is placed **on the science *behind* key concepts**– no clinical aspects (i.e., anatomy, pathology, etc.) will be taught.

Grading is as follows:

- Term Paper (30%)
- Oral Seminar Presentation (10%)
- Written Examination (60%)
(exact date to be determined by McGill)

Term Paper / Seminar

Each student must write a review (provide evidence for any statement you make and if there are problems or issues with the evidence, you will discuss them) in an area related to endocrinology. The paper should be typed in 12 font, double-spaced, and should be between 15 and 20 pages including tables, figures, and references. The length of the paper is a guide only. The papers are graded for quality not quantity, so it is possible for a shorter paper to be assessed a better grade than a longer paper. Some suggested topics are listed below but students may also select other topics. For students who select their own topic, please check with the course coordinators that the topic is appropriate for the course. Papers may be evaluated by any of the professors who take part in the EXMD 502 or 503 courses. Papers should cover the selected topic *in depth* rather than attempt a broad but superficial coverage of the topic area. Students must submit a digital copy (PDF or Word file) of the term paper. - Digital copies must be uploaded on MyCourses.

Seminars are evaluated by the course coordinators.

The topic you choose must be submitted via e-mail to Maryam Khodary for her approval at expmedcasual.medicine@mcgill.ca.

Term paper topic should *not* be a major focus of the host lab.

To avoid multiple presentations on the same subject, a MAXIMUM of two students *per topic* are allowed.

Submission of term paper topic and *completed* term papers must be made on time. Students who are unable to meet the deadlines should contact the course coordinators beforehand to explain the reasons for the delay. The course coordinators will evaluate whether there is adequate justification for the delay on a *case-by-case* basis.

	Suggested Topics for Term Paper
1	<i>Current concepts of steroid hormone action: genomic versus non-genomic</i>
2	<i>Hormonal regulation of testicular function</i>
3	<i>Hypothalamic releasing hormones – recent progress</i>
4	<i>Regulation of growth hormone release</i>
5	<i>Cell biology and biochemistry of peptide pro-hormone processing</i>

6	<i>ER stress signaling pathways and metabolic diseases</i>
7	<i>Inhibin and related hormones</i>
8	<i>Role of G proteins in hormone action</i>
9	<i>Current knowledge on pancreatic beta cells differentiation from ES cells</i>
10	<i>Role of intermediates of the phosphatidyl inositol pathways as second messengers</i>
11	<i>Role of food reward in obesity epidemics</i>
12	<i>Interaction of the reproductive axis with energy balance</i>
13	<i>Menopause onset: triggers and mechanisms?</i>
14	<i>Adolescence onset: triggers and mechanisms?</i>
15	<i>Morningness and eveningness: links to circadian pacemaker function?</i>
16	<i>Angiogenesis and diabetes</i>
17	<i>Why is the hunt for anti-obesity drugs so unsuccessful? Limitations in anti-obesity drug development</i>
18	<i>Mammalian sirtuins and energy metabolism</i>
19	<i>The roles of AMP-kinases and mTOR in energy regulation</i>
20	<i>Obesity, inflammation, and insulin resistance</i>
21	<i>Selective estrogen response modifiers (SERMs) in breast cancer therapy – their mechanism of action</i>
22	<i>The interactions between growth factor signalling and the integrin system</i>
23	<i>B-Adrenergic receptors and their involvement in cardiovascular disease (e.g. congestive heart failure)</i>
24	<i>Androgen receptors in the development and progression of prostate cancer</i>
25	<i>Crosstalk between the immune and hormonal systems</i>
26	<i>Coping with stress: hormonal response of the body</i>
27	<i>Diabetes: a disease of plenty?</i>
28	<i>Hormonal therapy for treatment of menopause: pros and cons</i>
29	<i>Hormonal regulation of bone remodelling</i>
30	<i>Causes and consequences of insulin resistance in diabetes</i>
31	<i>Bariatric surgery for type 2 diabetes: weight loss independent mechanism?</i>
32	<i>IGF-dependent and-independent functions of IGF binding proteins</i>
33	<i>Leptin resistance: causes and consequences</i>
34	<i>Somatic mutations of the androgen receptor and the selection of Castrate Resistant Prostate Cancer – origins and mechanism</i>
35	<i>The molecular etiology of obesity and androgens, and prostate cancer progression</i>
36	<i>The role of sex steroid hormones and metabolic syndrome</i>

47	<i>Molecular genetics of calcium homeostasis</i>
48	<i>Anti-catabolic and pro-anabolic drug therapy for osteoporosis</i>

Learning Outcome(s)

At the end of the course, the student should have a solid understanding of the science of Endocrinology and have acquired experience in written and oral presentation of biomedical concepts.

Policy

Instructor-generated course materials (e.g. handouts, notes, summaries, exam questions, etc) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow-up by the University under the Code of Student Conduct and Disciplinary Procedures.

If you have a disability, please contact the instructor to arrange a time to discuss your situation. It would be helpful *first and foremost*, if you contact the **Office for Students with Disabilities** at 514-398-6009.

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course *may be* subject to change.

Course Evaluations

End-of-course evaluations are one of the ways that McGill works towards maintaining and improving the quality of courses and the student's learning experience. You will be notified by e-mail when the evaluations are available on Mercury, the online course evaluation system. Please note that a minimum number of responses must be received for results to be available to students.

We strongly encourage students to complete their evaluations and provide feedback on the EXMD 502 and 503 courses by logging into Minerva/Mercury.

FALL 2022

ADVANCED ENDOCRINOLOGY (EXPERIMENTAL MEDICINE EXMD502)

MONDAYS & WEDNESDAYS 4:35-5:55 PM

Burnside Hall 708 (805 rue Sherbrook O.)

Course Coordinators:

Dr. Andrew Bateman: MUHC-RI Glen Site - E Block Building, Room EM2.3220, Ext. 35833

Dr. Maia Kokoeva: MUHC-RI Glen Site – E Block Building, Room E02.7218, Ext. 35360

August 31	Introduction to Advanced Endocrinology	A. Bateman
Sept. 5	LABOUR DAY	
Sept. 7	Ras-Mitogen activated protein kinase (MAPK) signalling	C. Rocheleau
Sept. 12	Receptors tyrosine kinases and their mechanisms of action	C. Rocheleau
Sept. 14	Biosynthesis and metabolism of steroid hormones	R.S. Kiss
Sept. 19	Mechanism of action of somatotropins and related factors	S. Ali
Sept. 21	Oct. 3 Neuroanatomy (Part 1) Via zoom	T. Stroh

Sept. 26	Biochemistry and physiology of parathyroid hormone	M. Murshed
Sept. 28	Biochemistry and physiology of Vitamin D	M. Murshed
Oct. 3 rd	Classes cancelled	
Oct. 5	Neuroanatomy (Part 2)	T. Stroh
Oct. 10	THANKSGIVING DAY (Deadline for submission of <u>TERM PAPER TOPIC</u>)	
Oct. 12	Fall Break	
Oct. 17	Function and role of androgen receptor in health and disease (Part 1)	M. Paliouras
Oct. 19	Function and role of androgen receptor in health	M. Paliouras
Oct. 24	Hypothalamic pituitary function tests	D. Morris
Oct. 26	Pathology of the adrenal gland	D. Morris
Oct. 31	<i>STUDENT SEMINARS*</i> KOKOEVA	A. BATEMAN/M.

Nov. 2	<i>STUDENT SEMINARS*</i>	A. BATEMAN/M.
KOKOEVA		
Nov. 7	<i>STUDENT SEMINARS*</i>	A. BATEMAN/M.
KOKOEVA		
Nov. 9	<i>STUDENT SEMINARS*</i>	A. BATEMAN/M.
KOKOEVA		
Nov. 14	<i>STUDENT SEMINARS*</i>	A. BATEMAN/M. KOKOEVA
Nov. 16	Receptors with 7-transmembrane domains and their mechanism of action (Part 1)	S. Laporte
Nov. 21	Receptors with 7-transmembrane domains and their mechanism of action (Part 2)	S. Laporte
Nov. 23	Biosynthesis and metabolism of prostaglandins and leukotrienes (Part 1)	S. Laporte
Nov. 28	Mechanism of action and the physiological effects of prostaglandins and leukotrienes (Part 2)	S. Laporte
	(Term Paper Due)	
Nov. 30	Circadian clocks and endocrine rhythms	K-F. Storch
Dec. 5	Lipid metabolism Via zoom	A. Baass

FINAL EXAMINATION PERIOD DECEMBER 6 – DECEMBER 20, 2021

(Date determined by Faculty)

*LOCATION:

Burnside Hall 708 (805 rue Sherbrook O.)