

Advanced Human Physiology: Endocrinology
KINE 4448 3.0-Term W 2023 (Section M)

Rooms:

DB 0005 (Mondays 2:30-4pm)

SLH C (Wed 2:30-4pm)

Course Director: Michael C. Riddell, PhD

Welcome to KINE 4448!

Objectives of the Course:

The endocrine system is responsible for so much of our daily health and function. It has several roles to play in our minute-by-minute survival and capacity to grow and develop. It plays a key role in how we grow and age. It also plays a role, sometimes, in causing illness and death. The objective of this course is to enhance our understanding of the main endocrine systems regulating growth and repair, temperature regulation, stress responses, energy metabolism, bone turnover, water balance and reproduction. The method of learning will be in person lectures and discussions in current and advanced topics in endocrinology. Classes will be recorded.

The goal of this course is to provide an overview of human endocrinology as it relates to human health and disease. The various hormone systems are presented from a physiological, biochemical and molecular perspective. The topics covered include: general concepts of endocrine physiology the mechanism of action of hormones and their receptors, second messenger systems, steroids and thyroid hormones, autocrine effects of growth factors, endocrine functions of the hypothalamus, posterior and anterior pituitary hormones, adrenal glucocorticoids and mineralocorticoids, the renin-angiotensin system, thyroid hormones, hormones regulating calcium balance, pancreatic hormones and energy homeostasis, and male and female reproductive physiology. Emphasis is placed on health and disease processes, as well as adaptations during exercise. Discussion of original research articles is included. The course emphasizes the physiological, cellular and molecular basis of the endocrine systems.

Optional Text: Molina, P.E. Endocrine Physiology, 5th edition (Lange McGraw Hill) or any earlier edition you can get your hands or eyes on. This can be accessed online (for a fee) via a few suppliers such as [Access Medicine](#). You can also find older editions via other text distributors used such as triftbooks.

NOTE: Much of what is covered in class is found in this text but no material from it will be on any exam. You can do well (i.e., get an A+) in this course without securing this text.

Instructor: Michael C. Riddell, Ph.D., E-mail: mriddell@yorku.ca

Lectures:

Monday and Wednesdays in the scheduled time slots (2:30-4:00PM)

DB 0005 (Mondays 2:30-4pm)

SLH C (Wed 2:30-4pm)

Student Evaluation:

Quiz 1	20%
Quiz 2	20%
Assignment	20% (due April 10th, by midnight uploaded to eclass)
Final Exam (cumulative)	40% (in the final exam period)
TOTAL:	100%

Important dates and tentative schedule:

Mondays	Wed
Jan 9-Introduction	Jan 11-General Principles of Endocrine Physiology
Jan 16- General Principles of Endocrine Physiology	Jan 18- General Principles of Endocrine Physiology
Jan 23- Hypothalamus and Post. Pituitary	Jan 25- Hypothalamus and Post. Pituitary
Jan 30- Feeding and Pleasure	Feb 1- Quiz 1
Feb 6- Anterior Pituitary gland	Feb 8- Anterior Pituitary gland
Feb 13- Anterior Pituitary gland	Feb 15- Pituitary disorders
Feb 22- No Lecture	Feb 24- No Lecture
Feb 27-Thyroid gland	March 1 - Thyroid gland disorders
March 6 - Parathyroid gland and Ca ²⁺ & PO ₄ ⁻ regulation	March 8- Adrenal gland
March 13 - Adrenal gland disorders	March 15- Endocrine Pancreas
March 20 – Diabetes (Type 2 pathophysiology)	March 22- Quiz 2
March 27 - Diabetes (Type 2 treatments)	March 29 -Diabetes (Type 1)
April 3- Integrated Endocrinology of Exercise	April 5- Reproductive Endo
April 10- Reproductive Endo (assignment due)	

Explanation of Exams and Assignments:

- **Exams: Both midterm quizzes and final exam will have** multiple choice questions and problem-based case studies (quizzes will be ~60 minutes in length, the final exam will be about 90 minutes). Often, the interpretation of graphs or diagrams like what is discussed in class will be required. The final exam is cumulative. Material found exclusively in the optional textbook is not considered examinable.
- **Missed Quizzes will be added to the final**
- **Assignment:** A few things I have noticed as a published researcher and educator is that A LOT OF STUFF IS PUBLISHED in the endocrinology field, sometimes in great journals and sometimes in lesser quality journals. It is impossible for me as a researcher to read everything in the stress, exercise and diabetes literature, the stuff that me and my lab team research, let alone all the other fascinating endocrinology research I enjoy learning about and teaching on in this class. The field of endocrinology is MASSIVE, sometimes contradictory and ever changing (new pathways, new drugs, new diseases, new treatments). Many researchers and clinicians who are engaged in endocrine research and care now turn to online resources to "skim" the news on what is being published in the top endocrinology, physiology and specialized medical journals that publish studies on the endocrine system in health and disease. The role of the scientific medical writer is now in high demand and with your training as an undergraduate student, you will take on that role in this class! **Your task:** First, pick a research article recently published (within last 2-3 years) in an endocrine/physiology or clinical journal that stimulates your interest in endocrinology (must be an endocrine related paper). Produce a high-quality and detailed news release, with an image, that highlights the published journal article. Several examples can be found online, but make sure yours is original (I will look). Include elements such as background information on the topic of study, study purpose, study methods, main findings and interpretation of the results as text, a visual abstract picture, limitations and future

directions. Please do not choose a review paper. See an example on one of my more recent publications highlighted by Healio News ([Endocrine today](#)) by Michael Monstra (make sure you put your name and student number on your News Report). Other examples can be found by Healio Endocrinology News [here](#) and by the Endocrine Society [here](#). It can be [human](#) or [non-human](#) research profiled. **Your assignment grade will be based on relevance to our coursework (10%), content (20%), readability (20%), your interpretation of the research (40%) and style/visuals (10%).** To accommodate these requirements, **produce a "news story" consisting of 600-1000 words** and make sure you cite the original paper somewhere using a hyperlink. Other hyperlinks can be used sparingly, and I highly recommend a summary visual (see this updated graphical [abstract](#)) since this often attracts attention on social media platforms such as Twitter to pull readers to your news story. You have the option to share your progress with me (I'm the one marking it so you might as well get some critical feedback) on or before March 3rd. Feedback after March 3rd is possible but will be less critical.

GOOD LUCK THIS TERM!