

ANATOMY 261

Introduction to Dynamic Histology

INSTRUCTORS:	Dr. Craig Mandato Dr. C. R. Morales
HEAD T.A.s	Paul Simon (paul.simon@mail.mcgill.ca) Corina Dekraker (corina.dekraker@mail.mcgill.ca) Dana Pearl (dana.pearl@mail.mcgill.ca)
LECTURES:	Tuesday, 10:05 - 11:25 pm Thursday, 10:05 - 11:25 pm
LABORATORY:	Tuesdays, 2:30 - 4:30 pm Wednesdays, 2:30 - 4:30 pm Thursday, 2:30 - 4:30 pm

Lectures will be given in Stewart Biology Auditorium (S1/4). The laboratories are in the Histology Laboratory (Room 1/56) located in the Strathcona Anatomy and Dentistry Building. There are 23, 1-1/2 hour lectures and 12 laboratory periods. The first lecture will be held on September 6th and the last lecture will be held on November 24 . Labs will begin the week of September 12th. There are no Labs the first week of class.

Lectures

- 1- Organization - Histological Methods I (Sept. 6)
- 2- Histological Methods II (Sept. 8)
- 3- Skin I: Epithelial Tissue (characteristic, classification, basement membrane) (Sept. 13)
- 4- Skin II: Epithelial Tissue (junctional complexes, cell cycle) (Sept. 15)
- 5- Skin III: Epithelial Tissue (annexes: hair follicle) Sweet and Sebaceous Glands (Sept. 20)
- 6- Skin IV: Dermis; Hypodermis. Connective Tissue (classification, cells, fibers, amorphous ground substance) (Sept. 22)
- 7- Cartilage and Bone (Sept. 27)
- 8- Bone Formation (Sept. 29)
- 9- Muscular Tissue (Oct. 4)
- 10- Neuromuscular Junction (Oct. 6)
- 11- Blood Vessels I (Oct. 11)
- 12- Blood Vessels II - Introduction to Glandular Epithelium (Oct. 13)
- 13- Respiratory System I (Oct. 18)
- 14- Respiratory System II (Oct. 20)
- 15- Digestive System I (Oral cavity, Salivary Glands) (Oct. 25)
- 16- Digestive System II (Tooth, Tooth Formation) (Oct. 27)
- 17- Digestive System III (Esophagus and stomach) (Nov. 1)
- 18- Digestive System IV (Intestine) (Nov. 3)
- 19- Digestive System V (Liver) (Nov. 8)
- 20- Digestive System VI (Pancreas) (Nov. 10)

- 21- Kidney (Nov. 15)
- 22- Kidney II, Pelvis, Ureter, Urinary Bladder (Nov. 17)
- 23- Nervous System I (Nov. 22)
- 24- Conclusion - Exam Demonstration (Nov. 24)
- 25- Review (Nov. 29)

Laboratories

- 1- Skin and Epithelial tissue
- 2- Skin Annexes
- 3- Skin Connective Tissue
- 4- Muscular Tissue
- 5- Blood Vessels
- 6- Cartilage-Bone-Bone Formation
- 7- Respiratory System
- 8- Digestive System I
- 9- Digestive System II
- 10- Digestive System III
- 11- Renal Tissue
- 12- Nervous Tissue

TEXTBOOKS

Recommended

Junqueira's Basic Histology, Anthony Mescher, 13th edition, Lange. McGill Bookstore

For Laboratory activities

Laboratory Manual (McGill Anatomy and Cell Biology Student Society - MACSS).

Berman, "Color Atlas of Basic Histology" 2nd Edition, 2002, Lange, Bookstore (optional).

Gartner and Hiatt "Color Atlas of Histology", 3rd edition, 2000, Williams and Wilkins, Medical Bookstore (optional).

Wheater, Burkitt and Daniels, "Functional Histology", 3rd edition, 1987, Churchill Livingstone.

Website:<http://people.mcgill.ca/carlos.morales/inthist/>
<http://www.medicine.mcgill.ca/dynhist/>

EVALUATION:

1. Written assignment - 10 marks
2. Laboratory participation – 5 marks
3. Laboratory quizzes – 5 marks
4. Final Examination
 - written essay-type questions - 30 marks
 - multiple choice-type questions - 30 marks
5. Final laboratory examination - 20 marks (spot-type identification on digitized pictures).
Final laboratory examination may (sometimes) be held on the same day as the written examination (to be confirmed).

Letter grades, only, are given.

Please not the following messages:

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

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 <http://www.mcgill.ca/students/srr/honest>) for more information).

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2015 Assignment

Due Date: Tuesday, October 6, 2015 No extensions. No exceptions.

***Note: Please include your LAB DAY on the title page**

Question 1 (20 marks)

- a) In the chemical fixation step of an H&E protocol describe why perfusion of a tissue is preferred over immersion.
- b) You receive a freshly prepared slide of a liver tissue that a lab colleague prepared with an H&E protocol. Upon placing it under the microscope you notice that the integrity of the cells are perfectly conserved but that there is close to no contrast throughout the slide. Your colleague is 100% certain that he used the correct dyes and you trust his certainty on that matter. Considering the above information, what did your lab mate do wrong?
- c) Provide a ONE sentence description of immunohistochemistry and provide a short (2 sentences max) explanation of the scientific concepts on which it is based.

Question 2 (40 marks)

- a. Describe the 5 key functions of the basement membrane and why diseases affecting its integrity are of a huge concern.
- b. Describe the two constitutive elements of a proteoglycan. Describe how a proteoglycan differs from a glycoprotein. Provide a short description of the proteoglycan specific to the basement membrane and its function it participates.
- c. In which layer of the epithelium are stem cells located? Provide the two biological principles (Time & Quantity) that govern the proliferation of these stem cells.
- d. Provide an explanation as to why cells are treated with taxol (a microtubule stabilizing drug) do not complete mitosis and state the stage of mitosis in which these cells will remain.

Question 3 (40 marks)

Medical histology can be used for various purposes, e.g. observing the state of a diseased organ, assessing the structure of an organ thought to be dysfunctional, searching for the manifestation of parasite contamination, etc.. Go to a scientific search engine (ex: PubMed) and find a research article published in the last three years that uses histology.

- Explain why the investigators used a histological technique in this publication (how was it useful, how will it answer the aim/question of the investigation, and why not use another technique)
- Describe the protocol used for this histological preparation (is it standard H&E, have other stains been used, was immunohistochemistry used...)
- Add a figure of this publication which shows the histological results and discuss how this figure fits in the publication (in terms of the results it offers, and how it addresses the question the investigators were out to answer)

References:

All websites, papers, and textbooks must be referenced in the text and in a bibliography at the end. *Note- Wikipedia and your professor's lecture notes are **NOT** appropriate references!

Format and Length:

6 Pages maximum using Arial size 12 and standard margins (2.54cm top and bottom, 3.17cm left and right).

Assignments, which do not respect these guidelines will be penalized by 5 marks (or more if deviation from required format is extensive).