



Histopathology 233

Semester One, 2012

Unit study package number:	311378 (v.1)
Mode of study	Internal
Tuition pattern summary:	Lecture: 1 X 2 Hours Weekly Practical: 1 x 3 Hours Weekly
Credit value	25
Pre-requisite Units	1644 v.7 Human Biology 134 or any previous version
Anti-requisite (s):	None
Core Unit Status:	SIGNIFICANT: Fail this unit TWICE and it may lead to the termination of your course.
Result type:	Grade and Mark

Unit Coordinator:	Name:	Dr Marilyn BENNET-CHAMBERS
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	Consultation times:	Any time door is open.
Tutor:	Name:	
	Email:	
	Group:	
Administrative contact:	Name:	Mrs Janette McLeod
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	Building : Room	Biomedical Sciences Building 308.122

Learning Management System: FLECS - Blackboard (oasis.curtin.edu.au)

Syllabus

This unit covers histology and some histopathology of the following systems; skin, musculoskeletal, cardiovascular, lymphatic, respiratory, digestive, endocrine, nervous and urogenital. Students will study the principles and applications of routine and some special histological methods used in histopathological diagnosis that characterise these systems, such as staining methods for lipids, mucosubstances and some common tissue pigments and neurohistological techniques when applicable to the systems studied. A systematic histological study through section cutting, staining and microscopical interpretation of selected tissues and organs from these systems will also be undertaken.

Introduction

Histopathology is the study of tissues. It relies on both light and electron microscopy to reveal cell, tissue and organ structures. A former student quoted histology as being the 'merging of science and art'. Cellular features are highlighted through the simple use of colour, which can appeal to the artistic soul. This colour then uncovers the structure within, which becomes a means to answer the why and how questions.

Cells are the underlying theme. This reflects the increasing importance of cell biology when we study the structure and function of tissues. The study of histology and cell biology involves all body systems and the inter-relationship between structure and function at all levels of organisation. Cells have many of the same component parts, however the components can vary in number, proportions, presence or absence, have modifications all of which give clues as to the function of the cell. For example proteins are produced in the rough endoplasmic reticulum (rER) and this process requires energy, which you may recall is made in the mitochondria. Therefore, a cell that produces large quantities of proteins will have considerable amounts of rER (and stain blue with a H&E) and mitochondria in the cytoplasm.

What histology can do is provide you with the means to find out what, how many and types of cells and tissues are present in an organ. Examination of these components, and understanding their function, can give clues to the overall function of an organ. Understanding and identification of the normal is essential to be able to recognise the pathological. Therefore, the emphasis of this course is that by understanding structure you can determine function. Histology helps identify cell and tissue structure, through various staining techniques, using both paraffin and frozen sections. This is a particularly useful skill as many cell and tissue types are ubiquitous across many species.

Unit Learning Outcomes

Upon successful completion of this unit you will be able to:

1. Fix, process and stain tissues in paraffin wax for histology. Perform routine staining skills including H & E and special stains on paraffin wax.
 2. Elucidate the function of various tissues and organs from examination of the types of cells present. Understand the diagnostic process and when and why special stains and histochemical reactions are used, and be able to perform and critically evaluate these procedures.
 3. Identify the features of different cell types and understand how these features reflect the function of the cell. Effectively identify and understand the structure and function of tissues and organs of selected systems through the preparation, staining, microscopic examination and interpretation of paraffin and frozen sections. Microscopically examine and critically analyse distinguishing tinctorial differences between tissue elements from routine and special stains for histopathological diagnosis.
 4. Demonstrate a basic knowledge of some of the differences between normal and abnormal tissues and an understanding of related introductory histopathological concepts.
 5. Demonstrate competence in routine and some special histological laboratory procedures and be able to independently implement these procedures in the work place.
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Learning Activities

Learning is an active process and is enhanced by approaching knowledge in different ways and from various angles, each time building on the knowledge acquired previously. To this end the content covered in HP233, is presented in various formats, and more than once, which assists the learning process, regardless of your own learning style; visual, auditory or tactile. There are topics covering histological structure of various systems and techniques used to examine these tissues. The material to be covered presented in through a lecture and then a practical application session. The theory underpinning different histological techniques and tissues is covered and then you apply these techniques at the practical level.

Lectures

Listening to a lecture, looking at the visual images that accompany the material presented by the lecturer, is often your FIRST exposure to the material to be covered. Lecture note summaries are made available on the Histopathology 233 FLECS-Blackboard site, however learning is assisted by actively making your own notes as you listen. Consequently you will have a record, in your OWN style, of the material covered. You will also have a record of the **additional** material and explanations that are not in the notes and are given during the lecture (see lecture program p.7 this document).

Practical Sessions

The practical sessions are hands-on activities, to acquire the skills necessary to section and/or stain various tissues either as paraffin or frozen sections. You will be expected to section, stain and complete an H&E of each tissue weekly and attempt TWO special stains (if applicable). This will be your SECOND exposure to the material and from a practical perspective. There is a practical report associated with each practical session.

You must download the relevant practical from the Histopathology 233 FLECS-Blackboard site each week prior to coming to the practical class. (<http://lms.curtin.edu.au>)

There are 10 practicals each of 3 hours duration and attendance is compulsory. **Practical classes will be held in Building 308.126** and start in **WEEK 1**. See table below for times of each group.

PRACTICAL GROUP	DAY	TIME
A	Monday	10am-1pm
B	Monday	2pm-5pm
C	Tuesday	10am-1pm
D	Tuesday	2pm-5pm

Dress Requirements: closed shoes must be worn in all laboratories & laboratory coats are essential.

Images relevant to practicals will be placed on the HP233 FLECS-Blackboard website (<http://lms.curtin.edu.au>) in the week following the conclusion of each topic/practical for all students enrolled in the unit. There will also be links to credible histology www sites available via HP233 FLECS-Blackboard.

Students are reminded that **attendance at practical classes is compulsory**. Absenteeism due to medical reasons must be supported with a detailed, valid medical certificate. Absenteeism for any other reason will only be granted in exceptional circumstances, with prior communication. Students who absent themselves from practical classes without valid medical certificates may find their evaluation marks for continuous assessment are adjusted *pro rata*.

Please note that the material presented in the practical sessions contributes to the information provided in this unit and is examinable.

Learning Resources

Essential Texts

You will need to purchase the following textbook in order to complete this unit:

1. Junqueira, LC & Carneiro, J. (2005) *Basic Histology*. (11th Ed.) Sydney; McGraw-Hill

OR

2. Eroschenko, VP (2005). *diFiore's Atlas of Human Histology with Functional Correlations* (10th Ed.) Baltimore : Lippincott, Williams & Wilkins.

Recommended Texts

You do not have to purchase the following textbooks but you may like to refer to them.

1. Ross MH and Pawlina W (2010). *Histology: A text and atlas. With Correlated Cell and Molecular Biology* (6th ed) Lippincott , Williams & Wilkins.
2. Young B, Lowe, JS, Stevens, A & Heath JW (2006). *Wheater's Functional Histology: A Text and Colour Atlas* (5th Ed). Edinburgh: Churchill Livingstone

Online Resources

1. **FLECS-Blackboard** –This will provide you with Module guidelines for all practical questions and other helpful resources for the unit, including announcements regarding the unit, HP233 and links to **Aperio** where many of the histopathology images associated with lectures, practicals and tutorials will be available. Access to images will only be made available after all students have completed a particular practical. This material will only be accessible to students enrolled in the unit.
2. **To access the online digital images you will need to click on the Aperio link on Blackboard.** This will open the spectrum home page. You will logon with your student number and the password is “student”. You will be prompted to change the password to your personal choice. You will be able to visit the practical material in Unit Information link on Blackboard to assist you in the start up and navigation to the stored images.

<http://lms.curtin.edu.au>

Laboratory Requirements

1. Microtomy Kit (available from Bookshop- Dissecting Kit)
2. Microtome Blades
3. Laboratory Coat

Assessment Schedule

Task	Value (%)	Date due	Unit Learning Outcome(s) assessed
Preparation and critical assessment of slides and identification of tissue	30%	Weekly AND Week beginning 21 st May	One, Two and Three
Mid Semester Test	15%	20 th April	One and Three
Tissue Project	15%	18 th May	One, Two, Three, Four & Five
Final Theory Exam	40%	Exam fortnight	One, Two and Three

Detailed information on assessment tasks

1. Preparation and critical assessment of slides and identification of tissue (30%)

a. Weekly (10%)

Each practical has a hands-on component that **MUST** be completed each week. Completed slides and/or staining, along with the completed Section Assessment sheet and Histo Report, must be checked, and then signed off by your tutor in order to obtain full marks. Images on Arperio will be available as supplemental material after each practical and are examinable.

Moreover, it is highly recommended that you complete all practical exercises as they are all examinable. Students who fail to attend a significant number (80%) of practicals may be awarded a fail for the practical component of the unit.

You must download the relevant practical from the Histopathology 233 FLECS-Blackboard site each week prior to coming to the practical class. (oasis.curtin.edu.au)

b. End of Semester (20%)

i. IDENTIFICATION ASSESSMENT (10%)

1. Short answer questions conducted during the lecture time indicated in the lecture outline (25th May). This will include questions based on images and information provided in all practicals including the Introductory Practical such as aspects of Laboratory safety, tissue fixation, processing & staining.

ii. PREPARATION ASSESSMENT (10%)

1. Cutting, staining and reporting on a tissue. To be held in your usual practical class in Week 12 of the semester as seen in the practical outline (21st or 22nd May).

2. Mid Semester Test (15%)

The theory test is short-answer image-based questions on the completed practical and lecture material. The test will be conducted during the lecture time in Week 7 as indicated in the lecture outline.

3. Tissue Project Report (15%)

This scientific report is an independent activity. You will be required to section, stain, identify and write up a scientific report of an unknown tissue block. Your write up will include a flow chart of stains used to aid in the identification of the tissue and include the logic behind use of each stain, i.e. what tissue characteristic was identified in the tissue that aided identification and be included in the Appendix. An assignment checklist will be provided to guide you through identification and presentation of the 4 to 5 A4 page scientific report that you will submit. All stained slides that aided in tissue identification must be included with the written report. Your report should include title page (including author and affiliation), introduction, methods, results sections with well-labelled diagrams and/ or photomicrographs, a brief discussion, reference list and appendix. Word limits will apply.

Marking criteria: The report will be assessed against a marking key provided. The focus of the assessment will be on both the quality of your sections and the logic underpinning your use of stains, clarity, identification of tissue, use of scientific report writing & referencing (Chicago or APA).

This is due Friday 18th May, 2012.

4. Final Theory Examination (40%)

This is a 2-hour exam conducted during the examination period in May/June. It comprises of a series of **short answer** and an **essay** question.

Fair assessment through moderation

Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that student work is consistently evaluated by assessors. Minimum standards for the moderation of assessment are described in the Assessment Manual, available from policies.curtin.edu.au/policies/teachingandlearning.cfm

Late penalties

Faculty of Health Sciences policy for late submission of assessments is 10% per day, including weekends.

Referencing style

Students should use the **Chicago** or **APA** referencing style when preparing assignments. Consistency is important. More information can be found on this style from the Library web site: library.curtin.edu.au/research_and_information_skills/referencing

Pass Requirements

In order to complete this unit for full credit towards your degree, you must complete ALL the assessments; Practicals, mid semester test, tissue project report, final practical, end of semester tissue identification/preparation assessments and the final theory exam. For details on the allocation of marks refer to the assessment schedule on page 4 of this outline.

To pass this unit an overall mark of 50% or greater for the combined total assessment must be achieved and a minimum of 50% should be achieved in the final THEORY exam. Please note that students attending **less than 80%** of the scheduled practical sessions may be **excluded** from the final examinations.

Supplementary information

Enrolment and HECS:

It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Supplementary/Deferred Exams:

Supplementary and deferred examinations granted by the School of Biomedical Science will be held in the week beginning **2nd July, 2012**. Notification to students will be made after the your Schools' Board of Examiners meeting via the Official Communications Channel (OCC) in OASIS (on welcome page- see Figure 1).

official communications channel (occ)

Your unread messages are listed below. Unread message more than 1 week old are highlighted in red. [View your complete inbox.](#)

	From	Subject
	Curtin Parking, Traffic & Security	Closure of Bentley Campus Saturday 18 December 2010

Figure 1 OCC

It is the student's responsibility to check their OASIS account for official Curtin correspondence on a weekly basis. If your results show that you have been awarded a supplementary or deferred exam you should immediately check your OASIS email for details. Please note the following:

1. Your final results are NOT available until after your school's Board of Examiners meeting. This is held in the SECOND week AFTER the examination period. You CANNOT obtain your marks by calling your tutor or the unit coordinator, but must wait until the examinations office in central administration

releases them in the week following the board meeting. These are published on the Curtin University website. Please do not contact us asking for your marks.

2. SUPPLEMENTARY and DEFERRED examinations are awarded only at the discretion of the Board of Examiners. It is your responsibility to be available at this time should a supplementary/deferred exam be awarded. **No other time** will be arranged.

Plagiarism

Plagiarism occurs when work or property of another person is presented as one's own, without appropriate acknowledgement or referencing. Plagiarism is a serious offence. For more information refer to academicintegrity.curtin.edu.au

Plagiarism Monitoring

The Mystery Tissue report will be monitored for plagiarism using Turnitin (see turnitin.com). Students who do not want assignments retained in the Turnitin database must lodge a special request prior to the submission date. For further advice see academicintegrity.curtin.edu.au/studentsturnitin.html

Student Rights and Responsibilities

It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter,
- the University's Guiding Ethical Principles,
- the University's policy and statements on plagiarism and academic integrity,
- copyright principles and responsibilities,
- the University's policies on appropriate use of software and computer facilities,
- students' responsibility to check enrolment,
- deadlines, appeals, and grievance resolution,
- student feedback,
- other policies and procedures
- electronic communication with students

See students.curtin.edu.au/rights for comprehensive information on all of the above.

Academic problems

Students experiencing difficulties with the academic content of this unit should see their tutor or the lecturer responsible for the subject matter presenting problems or the **Unit Coordinator, Dr M Bennet-Chambers**, whose details appear on the front page of this unit outline.

Internet/FLECS-Blackboard access problems

Any problems associated with internet/FLECS-Blackboard access should be addressed to **Randy Strack** at: R.Strack@curtin.edu.au

Arperio access problems

Any problems associated with Arperio access should be addressed to **Eleanor Morgan** at: E.Morgan@curtin.edu.au

HISTOPATHOLOGY 233

LECTURE PROGRAM, SEMESTER 1 2012

Friday 10am-12pm; Lecture Theatre 201.322

WEEK	WEEK BEGINNING	Hour	LECTURE	
0	20/02/12		Welcome & Overview	MBC
1	27/02/12	1 2	Introduction to Histology Fixation, tissue processing, cutting & staining (H&E)	VW
2	05/03/12	1 2	Tissue & Organ Overview including Epithelium Skin Histology	MBC
3	12/03/12		Muscle & Connective Tissues	HC
4	19/03/12		Bone & Mineralised tissue	MBC
5	26/03/12	1 2	Lipids & frozen sections Nervous system	VW MBC
6	2/04/12	1 2	CVS Histology Lympho-reticular system	MBC VW
7	9/04/12		EASTER WEEK FREE	MBC
8	16/04/12	1 2	MID-SEMESTER TEST Mystery tissue report: How to write the report	MBC
9	23/04/12	1 2	Mucins	VW
10	30/04/12	1 2	Digestive System I-Tract Digestive System II- Glands	MBC
11	7/05/12	1 2	Urinary System Histology Respiratory System Histology	MBC
12	14/05/12	1 2	Male Reproductive System Female Reproductive system	SM
13	21/05/12	1 2	END OF SEMESTER TISSUE IDENTIFICATION ASSESSMENT	MBC
14	28/05/12		STUDY WEEK	
15	4/06/12		EXAMINATIONS	
16	11/06/12			

**Lecturers: Marilyn Bennet-Chambers (MBC), Simon Mahoney (SM), Vin Williams (VW),
Hannah Crabb (HC).**

Lecturers

Dr Marilyn Bennet-Chambers
A/P Vincent Williams
Simon Mahoney (SM)
Dr Hannah Crabb

Email

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s.mahoney@curtin.edu.au
Hannah.Crabb@curtin.edu.au

HISTOPATHOLOGY 233

PRACTICAL PROGRAM, SEMESTER 1 2012

Monday/Tuesday 10am-1pm/2pm-5pm; 308.126

WEEK	WEEK BEGINNING	PRACTICAL	TOPICS
1	27/02/12	Practical 1	Introductory Practical Laboratory Safety & Layout. Demonstration: Cutting, H&E and Section analysis Practice: Cutting.
2	05/03/12	Practical 2	Paraffin sectioning & staining H&E Heart
3	12/03/12	Practical 3	Paraffin sectioning & staining H&E and Light Hx Skin & Aorta
4	19/03/12	Practical 4	Connective Tissue Stains 1 VVG Skin, Heart & Aorta Sectioning Decalcified bone
5	26/03/12	Practical 5	Connective Tissue Stains 2 MT & Gomori Skin, Heart, Aorta & Decal bone
6	2/04/12	Practical 6	Nervous System Frozen sections: Lipids NBS Paraffin sections: Nerve & Glial cells: LFB & GME
7	9/04/12	EASTER WEEK FREE	
8	16/04/12	Practical 7	Paraffin sectioning H&E and G&S, PAS (LI control) Lymph node, thymus & spleen
9	23/04/12	Practical 8 MT	Mystery Tissue project: Sectioning & staining All stains available
10	30/04/12	Practical 9	Paraffin sectioning & frozen sections Paraffin: Stomach, SI, LI, Pancreas, Liver: H&E PAS & AB of LI Frozen sections: H & E and ORO Liver
11	7/05/12	Practical 10 ¹	Respiratory & Urinary Paraffin sectioning H&E and Gomori's Trachea, inflated lung, kidney, ureter
12	14/05/12	Practical 11	Paraffin sectioning H&E Ovary, testes, oviduct, vas deferens
13	21/05/12	END OF SEMESTER SLIDE PREPARATION ASSESSMENT	
14	28/05/12	STUDY WEEK	
15	4/06/12	EXAMINATIONS	

NB. Remember to download the weekly Worksheet for each practical from the Histopathology 233 FLECS Blackboard site prior to attending class.