

Liverpool John Moores University

Title: HISTOLOGY AND TOXICOLOGY
Status: Definitive
Code: **5017BMBMOL** (117304)
Version Start Date: 01-08-2019

Owning School/Faculty: Pharmacy & Biomolecular Sciences
Teaching School/Faculty: Pharmacy & Biomolecular Sciences

Team	Leader
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Academic Level: FHEQ5 **Credit Value:** 24 **Total Delivered Hours:** 52
Total Learning Hours: 240 **Private Study:** 188

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	41
Practical	8
Workshop	1

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	ASS1	3 essay questions from 5	40	2
Practice	ASS2	Histology laboratory based practical and questions to be answered outside of practical class	30	
Report	ASS2	In Vitro toxicity testing assignemnt: Data analysis and questions	30	

Aims

To provide students with an understanding of micro and macroscopic structures of cells, tissues and organ systems.

To allow students to develop knowledge and practical skills in histological techniques.

To introduce students to the principles of toxicity and structural manifestations of toxicity to cells, tissues and organ systems.

Learning Outcomes

After completing the module the student should be able to:

- 1 Recognise sections of tissues selected from the major organ system and discuss methods of preparation of tissues for histological examination.
- 2 Explain the major molecular mechanisms of toxicity, and describe and recognise significant cellular pathological changes associated with such toxicity to cells, tissue and organ systems.
- 3 Explain the absorption, distribution and elimination of drugs and other xenobiotics.
- 4 Discuss in vivo and in vitro toxicity testing.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Exam	1	2	3	4
Lab practical	1			
Data analysis	4			

Outline Syllabus

Tissue preparation: fixation, tissue processing, paraffin wax and freezing.

Microtomy: for paraffin wax cryostat sectioning.

Histological staining: general tissue stains, stains to demonstrate connective tissues, carbohydrates, lipids and microorganisms, principles of immunohistochemistry.

Functional histology: Common tissue structures – liver, kidney, respiratory system, GI tract, pancreas.

Mechanisms of toxicity: Free radicals, lipid peroxidation and reversible and irreversible interactions of chemicals with cellular macromolecules. Protective agents; antioxidants and glutathione.

Structural manifestations of toxicity: Pathological changes occurring in cells, tissues, organs. Cell injury; degeneration, inflammation, cell death. Atrophy, hyperplasia, hypertrophy, metaplasia, dysplasia and neoplasia. Restructuring and repair of cells and tissues.

Principles of pharmacokinetics: Absorption, distribution, metabolism and excretion of drugs and other xenobiotics.

In vivo/In vitro toxicity testing.

Learning Activities

Material will be delivered through lectures, practical classes and workshops. The lectures will be designed to introduce two main themes to the students histology and toxicology, while helping students understand how these topics integrate from a biochemical and biomedical perspective. Students will undertake a substantial practical component to enable them to develop valuable practical skills in histological techniques. A workshop will be delivered to enable the students to develop their analytical skills in pharmacokinetics. Coursework assessment will provide a platform for the students to learn many aspects of histology and toxicology while also helping them develop a range of academic and transferable skills.

Notes

This module will provide students with an understanding of the scientific basis of histology and toxicology. In particular the module will provide the students with an understanding of microscopic structures of tissues and organ systems in the context of cellular activity and toxicological pathology. The module will also enable the student to develop practical skills in histology and gain an understanding of pharmacokinetics and in vitro toxicity at the molecular level.