



THE UNIVERSITY OF  
BUCKINGHAM

MEDICAL SCHOOL

**MB ChB**

## **Unit Summary: Tissues of the Body**

## 1 Educational Aims of the Unit

The unit aims to enable students to make progress towards meeting some of the learning outcomes described in Tomorrow's Doctors (2009) relevant to 'The Doctor as a Scholar and Scientist' and 'The Doctor as a Professional'. In particular, students will develop an understanding of the human body as a cellular system, classify its tissues as epithelial, connective, muscular or nervous, identify several examples of each, explain their embryological derivation, apply a knowledge of histological and anatomical structure to predict function, and state examples of the cellular basis of disease.

## 2 Learning Outcomes From Tomorrow's Doctors (2009)

### Outcomes 1: The Doctor as a Scholar and Scientist.

8. The graduate will be able to apply to medical practice biomedical scientific principles.

- a) Explain normal human structure and functions.
- b) Explain the scientific bases for common disease presentations.
- c) Justify the selection of appropriate investigations for common clinical cases.
- d) Explain the fundamental principles underlying such investigative techniques.
- g) Make accurate observations of clinical phenomena and appropriate critical analysis of clinical data.

12. Apply scientific method and approaches to medical research.

- a) Critically appraise the results of relevant diagnostic, prognostic and treatment trials and other qualitative and quantitative studies as reported in the medical and scientific literature.
- b) Formulate simple relevant research questions in biomedical science, psychosocial science or population science, and design appropriate studies or experiments to address the questions.
- c) Apply findings from the literature to answer questions raised by specific clinical problems.

### Outcomes 3: The Doctor as a Professional

20. The graduate will be able to behave according to ethical and legal principles. The graduate will be able to:

- e) Recognise the rights and the equal value of all people and how opportunities for some people may be restricted by others' perceptions.

21. Reflect, learn and teach others.

- b) Establish the foundations for lifelong learning and continuing professional development, including a professional development portfolio containing reflections, achievements and learning needs.
- c) Continually and systematically reflect on practice and, whenever necessary, translate that reflection into action, using improvement techniques and audit appropriately for example, by critically appraising the prescribing of others.
- d) Manage time and prioritise tasks, and work autonomously when necessary and appropriate.
- e) Recognise own personal and professional limits and seek help from colleagues and supervisors when necessary.

### 3 *Teaching and Learning Strategies*

Principles will be introduced in formal lectures, and learning will be re-inforced in practical classes and facilitator led small-group work immediately afterwards. Student will work in the same teams throughout Phase I to encourage team-working.

Some concepts will be discussed in more detail in tutorials, and Moodle- based tests and coursework will allow for formative assessment. Students will be provided with workbooks describing structured tasks to direct independent learning throughout the unit, and ongoing use of an e-portfolio will nurture and encourage reflective practice.

### 4 *Unit Outline/Syllabus*

#### **Session 1: Methods in Light Microscopy & Epithelial Tissues**

Lecture: Methods in light microscopy

Group work: Light microscopy. Introduction to anatomy.

Lecture: Epithelial tissues

Group work: Virtual microscopy of simple & compound epithelia

#### **Session 2: Glandular Tissues & Internal Surfaces of the Body**

Lecture: Glandular tissues and how cells secrete

Group work: Glands - structural and functional relationships

Lecture: Internal surfaces of the body

Group work: Virtual microscopy of glands

#### **Session 3: Cell Ultrastructure & Introduction to Microbiology**

Lecture: Cell Ultrastructure

Group Work: Interpretation of light and electron micrographs of epithelia, glands and internal surfaces of the body.

Lecture: Bugs in the System

#### **Session 4: Viruses in Human Tissues & Early Embryonic Development 1**

Lecture: Viruses

Group Work: Surfaces of the body.

Lecture: Early embryonic development 1

#### **Session 5: Connective Tissue & Skin**

Lecture: Connective tissue

Group work: Structural and functional characteristics of connective tissue

Lecture: Skin, its accessory structures and disorders

Group work: Virtual microscopy of connective tissue and skin

Formative assessment placed on Moodle for completion within two weeks.

#### **Session 6: Early Embryonic Development, & Cartilage & Bone**

Lecture: Early embryonic development 2

Group Work: Tutor-facilitated interpretation of connective tissue micrographs.

Lecture: Cartilage and bone

**Session 7: Ossification & Bone Disease, & Formative Assessment Review**

Lecture: Ossification and bone disease

Group Work: General review cartilage and bone. Formative assessment review.

Virtual microscopy of cartilage and bone micrographs.

**Session 8: Muscle & Disorders of Muscle**

Lecture: Muscle

Group work: General review – muscle.

Lecture: Disorders of Muscle

Group work: Virtual microscopy of muscle.

**Session 9: Nervous Tissue & the Autonomic Nervous System (ANS)**

Lecture: Neurons, nerve fibres and peripheral nerves

Group work: General review – peripheral nerves and spinal cord. CNS & PNS.

Lecture: Organisation of the autonomic nervous system

Group work: Virtual microscope questions based upon peripheral nerves & spinal cord.

**Session 10: Blood Cells & Early Embryonic Development 3**

Lecture: Blood cells and haematopoiesis

Group work: Virtual microscope questions based upon blood smear micrographs.

Lecture: Early embryonic development 3 (Early development of the musculoskeletal system).

Group work: Anatomy revision

**Session 11: Innate and Adaptive Immunity**

Group Work: Tutor-facilitated interpretation of muscle, nerve and blood micrographs.

Lecture: Innate and adaptive Immunity

**Session 12: Revision Week**

## 5 *Secondary Learning Outcomes*

- In addition to meeting the outcomes described in Tomorrow's Doctors, at the completion of the unit students will be able to:
- Describe early embryonic development including the origin of germ layers and tissues.
- Interpret electron micrographs of the main organelles of the eukaryotic cell, and light micrographs of epithelial, connective, muscle and nervous tissues, explaining structure-function relationships in each case.
- Recognise and classify the main types of simple and compound epithelia, explaining their function and the role of cell surface specialisations.
- Classify simple and compound glands on a structural and functional basis, outlining their epithelial derivation and differentiating between exocrine and endocrine glands
- Classify connective tissue types and summarise the function of their cellular and extracellular components.
- Describe the structural and functional relationships between epithelial, connective, muscle and nervous tissues which permit more complicated arrangements at body surfaces, particularly in the skin, but also in the gastrointestinal wall.

- Outline how some diseases affect skin (see module workbook for diseases)
- Recognise and explain the function of different types of cartilage and bone, describing the process of ossification and how some diseases affect bone.
- Recognise the different cells of the blood in micrographs, outlining their origin, and comparing their functions.
- Recognise and explain the structure and function of skeletal, cardiac and smooth muscle, and describe the defects occurring in the muscle disorders (e.g. myasthenia gravis, muscle atrophy and muscular dystrophy).
- Describe the structure and function of neurones and their respective supporting cells.
- Define the autonomic nervous system and explain its subdivision into sympathetic and parasympathetic systems in structural and functional terms.

## 6 Key Texts and/or Other Learning Materials

### Recommended text books:

- Color Atlas of Histology, 6th Edition, by Leslie P. Gartner and James L. Hiatt, Lippincott, Williams and Wilkins
- Langman's Medical Embryology, 12th Edition, by TW Sadler, Lippincott

### Useful textbooks:

- Junqueira's Basic Histology: Text and Atlas, 13th Edition, by Anthony L Mescher, McGraw-Hill Medical
- Wheater's Functional Histology, 5th Edition by Young, Woodford and O'Dowd
- Color Textbook of Histology, 3rd Edition, by Leslie P. Gartner and James L. Hiatt, Elsevier
- Histology: A Text and Atlas with Correlated Cell and Molecular Biology, 6th Edition, by Michael R. Ross and Wojciech Pawlina, Lippincott

### On-line digital histology slide archive:

- University of Michigan Virtual Histology: <http://histology.med.umich.edu/node/84>

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*Document Version Information*

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