

BBIO310 Organisation of Cells, Tissue and Body Systems

ECTS Value: 5 ECTS

Module Description

This unit deals primarily with the cellular basis of life. It looks into the classical cell theory, viruses, the prokaryotic and the eukaryotic cell, cell-division and cell-cycle. It also explores the scientific developments of microscopy and other experimental methods in cell biology which have produced significant advances in our knowledge of cellular structure. The structural complexity of eukaryotic cells is reviewed and the significance of the diversity of membranous structures is given importance. This unit also delves into the relationships between the chemical structures and functions of these membranes. The models of cell membranes are discussed in view of their role and functions in the biological processes of a cell. The unit introduces the way the body performs in a highly coordinated way via the complex levels of organisation of tissues, organs and body systems. So, it focuses at how groups of cells of similar structure and function assemble to form tissues, performing specific functions benefitting the living body. This unit gives a holistic overview of different eukaryotic cells and tissues, focussing mainly on flowering plants and the human being. It also introduces the common anatomical terms related to body regions and cavities, planes and location with special reference to the human body. An appreciation of the evolutionary trends in the complexity of organisation within the realm of biodiversity is central in the outcome of this unit.

Overall Objectives and Outcomes

By the end of this module, the learner will be able to:

Competences

- a. Recognise cells based on their internal organisation.
- b. Develop an understanding that cell structure reflects cell function.
- c. Develop an understanding of the process of cell division.
- d. Differentiate between the different transport processes across cell membranes.
- e. Develop an understanding of the main types of tissues of animals and plants.
- f. Evaluate the organisation of tissues, organs and organ systems in maintaining stable body functions.
- g. Engage with literature to keep abreast with the latest discoveries on cell biology.

Knowledge

- a. Describe the general structure of a prokaryotic cell.
- b. Describe the structure of a generalised eukaryotic cell.
- c. Describe the cellular changes that occur with aging.

- d. Explain the features of the eukaryotic cell of structural importance.
- e. Illustrate the sequence of events of cell division.
- f. Discuss the models of the plasma membrane.
- g. Explain the processes of transport across the plasma membrane.
- h. Trace the sequence of basic events in the process of differentiation and development of cells into tissues.
- i. Describe anatomical position of a living body with special reference to the human body.
- j. Describe the structural organisation of a living body with reference to the flowering plant and the human body.

Skills

- a. Investigate different microscopy and experimental techniques used on the study of cells, tissues and organs.
- b. Relate the structure of the cellular organelles to their function.
- c. Interpret the different roles of the plasma membrane in view of its biochemical components.
- d. Distinguish between somatic and reproductive cell division.
- e. Relate the structure of the various tissues to their specific function.
- f. Compare the organisation of different tissues in animals and plants.
- g. Use the light microscope to study histological slides of tissues.
- h. Interpret cellular and tissue structural organisation using micrographs.
- i. Compare the different levels of complexity of organisation as evolved in the biodiversity of living bodies.

Mode of Delivery

This module adopts a blended approach to teaching and learning. Information related to the structure and delivery of the module may be accessed through the IfE Portal. For further details, kindly refer to the Teaching, Learning and Assessment Policy and Procedures found on the Institute for Education's website.

Assessment Methods

This module will be assessed through: Research Assignment and Online Tasks/Reflections.

Suggested Readings

Core Reading List

1. Urry L., Cain M.L., Wasserman S., Minorsky P.V., Reece J.B., (2017) Campbell Biology. Pearson.
2. Tortora, G.J. and Bryan D.(2018) Essentials of Anatomy and Physiology. Pearson.
3. Fox S. and Rompolski K. (2016). Human Physiology. 15th Edition McGraw Hill Education.

Supplementary Reading List

1. Marieb E.N. and Hoehn K.N. (2014) Human Anatomy & Physiology. Pearson New International Edition (9th Edition).
2. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., Walter, P., (2015) Molecular Biology of the Cell. 5th Edition. Garland Science Publishing.
3. Berg, J. M. (2006) Biochemistry. W. H. Freeman. 6th Edition. W. H. Freeman.
4. Cooper, G. M and Hausman, R. E. (2016), The Cell: A Molecular Approach, 5th Edition, Sinauer Associates Inc. Associates Inc.