

Module Specification

Module Summary Information

1	Module Title	Molecular Basis of Disease
2	Module Credits	20
3	Module Level	6
4	Module Code	BMS6002

5	Module Overview
<p>An understanding of a disease at the cellular and molecular level is important for those working in the biomedical sciences. This module is designed to explore the molecular, biochemical and cellular changes in human disease and how this has contributed to the development of novel diagnostic tools and of knowledge-based treatment strategies. It will also provide you critical-thinking skills to explore human health and diseases through reference to primary research articles, and reviews.</p> <p>Topics that you will cover include aging and tissue repair, genetic and metabolic disorders, and cancer. Throughout this module you will be introduced to a number of molecular approaches for analysis of cells and tissues in health and disease.</p> <p>Alignment with Programme Philosophy and Aims: This module provides opportunities for you to develop qualities, skills and other attributes that are readily transferable into a range of employment and options for future study. You will demonstrate an in-depth knowledge and understanding of cellular and molecular basis of diseases and communicate effectively scientific information and concepts in a written format. You will develop your intellectual skills by actively questioning and seeking relevant information, comparing and contrasting information from different sources online and offline, critically evaluate information from a range of research resources, actively analyse and apply problem-solving strategies to develop independent, self-directed learning skills for life-long learning.</p> <p>Learning and Teaching Strategy: This module will use a blended approach to facilitate your learning. Lead lectures outline core concepts and provide you with a framework for extensive independent study of the core syllabus which will be underpinned by a range of online resources, textbooks and scientific articles. Lectures will emphasise selected examples of medical conditions where your cell biology, biochemistry and genetics knowledge from Year 1 and the Clinical Biochemical and Cellular Analysis module from Year 2 provide an essential foundation for the understanding of the molecular basis of human disease. Lectures will contain a mix of information delivery, interactive elements using Student Response Polling system and selected case studies which develop your investigational, critical thinking, data interpretation, problem solving and team working skills. Tutorials will address selected topics within the field of cellular pathology in greater depth, to facilitate critical discussion, and develop a critical awareness.</p>	

The module will be supported by an online Moodle site, where a range of pre- and post-session resources and journal articles will be available to facilitate your critical thinking and analysis. Active and informed participation through pre- & post-session work will be an integral component of the module. Engagement in forum discussion will allow for the development of learning communities to enhance the learning experience of you and your peers.

To achieve the required 20 credits for this module, you will need to dedicate at least 200 hours studying the module material. For this module, the time is broken down in an approximately 20:80 ratio (directed: self-directed). The scheduled learning activities will include lectures, seminars, tutorials, practical sessions and forum discussions.

Assessment:

A written essay of 3000 word in length on the molecular basis of a specific named disease state relevant to the topics covered in the module. This should be submitted at the end of the term.

6	Indicative Content
	<p>Introduction to cancer: Causes of cancer, epidemiology, morbidity and mortality.</p> <p>Molecular nature of cancer: signalling pathways, cell cycle control, DNA repair mechanisms, apoptosis, inflammation. Metastasis and angiogenesis.</p> <p>Cancer Genetics: Inherited cancers and inherited predisposition to cancer. Chromosomal abnormalities</p> <p>Cellular pathology: analysis of selected cancers e.g. breast, colorectal, cervical; haematological malignancies. Screening programmes.</p> <p>Current advances in cancer diagnosis and therapy: Molecular methods for cancer diagnosis and management. Chemotherapy, immunotherapy, novel drug therapies.</p> <p>Ageing: genes and genomic instability associated with aging, dietary-restriction associated genes, longevity and healthy aging.</p> <p>Mechanisms of Ageing: Inflammation, free radicals (ROS and RNS) and cellular damage. Mitochondrial DNA damage, non-enzymatic protein glycation linked with diabetic complications and protein nitration and disease association. The ageing immune system.</p> <p>Genetic basis of inherited metabolic disorders: types, causes, diagnosis and treatment. Including diabetes, DIDMOAD (Wolfram syndrome), familial hypercholesterolemia, Gaucher disease etc.</p>

7	Module Learning Outcomes
	<p>On successful completion of the module, students will be able to:</p>
	<p>1 Explain the molecular mechanisms of disease processes and the consequences of disturbed homeostasis at the cellular level.</p>
	<p>2 Evaluate the current research on molecular understanding of diseases.</p>
	<p>3 Explore how the development of new approaches for diagnosis and therapies can arise from knowledge of the molecular basis of disease.</p>

8 Module Assessment			
Learning Outcome			
	Coursework	Exam	In-Person
1,2,3	X		

9 Breakdown Learning and Teaching Activities	
Learning Activities	Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	40
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	50
Private Study (PS) includes preparation for exams	110
Total Study Hours:	200