CANCER - PATHOGENESIS AND THERAPEUTICS - 2024/5

Module code: BMS3063

Module Overview

Gives the student a broad understanding of cancer as an umbrella term for a complex set of different diseases unified by common cellular mechanisms. Students will examine the biological processes underlying cancer and have an appreciation of a range of clinically relevant diagnostic and therapeutic approaches. The emphasis is on human studies and clinical data, with animal studies and cancer-relevant pre-clinical models also presented. This module fits well within a biomedical sciences program.

Module provider

School of Biosciences

Module Leader

MEIRA Lisie (Biosciences)

Number of Credits: 15

ECTS Credits: 7.5

Framework: FHEQ Level 6

Module cap (Maximum number of students): N/A

Overall student workload

Independent Learning Hours: 94

Lecture Hours: 12

Tutorial Hours: 12

Guided Learning: 12

Captured Content: 20

Module Availability

Semester 2

Prerequisites / Co-requisites

BMS2036 - MOLECULAR BIOLOGY AND GENETICS: FROM GENES TO BIOLOGICAL FUNCTION

Module content

Introduction to cancer: causes, epidemiology, lifestyle + environment

Histopathology of cancer: classification of cancer lesions, the pathologist’s perspective Development of cancer: from cancer initiation to disease progression and metastases

Molecular processes underlying cancer: cancer hallmarks, oncogenic changes working singly and in parallel

DNA damage and repair: mismatches and mutations, DNA repair in cancer development and cancer treatment, cancer prone syndromes

Viruses and genetic factors: virally induced cancers, familial cancers, common genetic defects in cancer

Common cancers: breast, colon and lung cancer:; incidence, disease presentation, associated genetics, risk factors

Cancer therapy: conventional cancer chemotherapy drugs: main classes, mechanisms of action, toxicities, tumour types treated

Drug resistance: the clinical problem and underlying mechanisms

New targeted therapy for cancer: growth factor receptors, oncogene targets, anti-angiogenics, new developments.

Immunotherapy: cancer treatment in the 21st century

Clinical Case study: real cancer patient cases, presentation and subsequent treatment pathways Revision sessions

Assessment pattern

Assessment type	Unit of assessment	Weighting
Coursework	1 coursework essay from a choice of 3 topics, 1500 words.	30
Examination	Invigilated PC Lab Exam (2 Hours)	70

Alternative Assessment

N/A

Assessment Strategy

The Assessment strategy includes:

Extended reading and analysis of relevant material: Coursework essay is based on topics that are related to but not directly covered in the lecture series.

Engagement in the use of feedback: there will be coursework and exam tutorials where guidance will be given to students about

coursework format and assessment criteria.

Engagement in the use of feedback II: there will be tutorials and consultation sessions with an opportunity to discuss feedback and marks received for the coursework submitted.

A depth of understanding and integration of knowledge about molecular mechanisms, cancer pathogenesis and therapeutic approaches in an invigilated examination essay (1 question answered from a choice of 3).

Thus, the summative assessment for this module consists of:

- Coursework, 30%, 1500 words (addresses learning outcome 1)
- Exam, 70% (addresses learning outcomes 1 to 4)

Formative assessment:

Students will be provided with opportunities to discuss their previous submitted work in the context of grade descriptors and assessment criteria.

Feedback:

Verbal feedback during tutorials and coursework feedback will inform final summative assessment.

Module aims

- Provide an understanding of the factors responsible for the development of the most common forms of cancer and students will have an appreciation of the development of cancers both from a molecular viewpoint and also from early precancerous lesions to terminal disease from the viewpoint of histopathology.
- To provide an understanding of how genetics, environmental and stochastic factors contribute to the development of human cancers.
- Demonstrate how we can interfere with the development of cancers in a chemo-preventative setting, by the use of chemotherapeutic agents and also gain an understanding into the development and use of new therapies based on rational design and immunotherapy.

Learning outcomes

		Attributes Developed
001	Understand the factors responsible for the development of common and rarer types of cancer	KT
002	Appreciation of the development of cancers from early precancerous lesions to terminal disease from the viewpoint of histopathology and molecular changes in cancer cells.	KT
003	Understand how one can interfere with the development of cancers both in a chemo-preventative setting and also by the use of chemotherapeutic agents	KCT
004	Gain an understanding into the development and use of new diagnostic tools and targeted therapies based on rational design	KCPT

Attributes Developed

C - Cognitive/analytical

K - Subject knowledge

T - Transferable skills

P - Professional/Practical skills

Methods of Teaching / Learning

The learning and teaching strategy is designed to ensure that students achieve the modules learning outcomes and develop competencies in the corresponding aspects of the curriculum framework (employability, digital capabilities, global and cultural intelligence, sustainability, resourcefulness and resilience).

Provide pre-recorded lectures by research active experts in the field of cancer research including clinical oncologists.

Consolidating knowledge, expanding and connecting content with weekly tutorial sessions.

Allow integration of knowledge of molecular mechanisms and disease pathogenesis of a variety of cancer types.

Introduce the students to concepts of therapeutic strategy and design within the context of cancer pathogenesis.

The learning and teaching methods include:

- Pre-recorded material available on-demand via SurreyLearn
- Weekly tutorials and lectures. Tutorials will include use and review of websites or databases of relevance to topic, such as the International Agency for Research in Cancer (IARC) and the COSMIC database of human cancer mutations.
- Clinical study lecture given by a medical oncologist (pre-recorded).
- Sessions for advice on scientific writing and the correct use of referencing (for coursework).
- Pre-exam revision tutorial.

Indicated Lecture Hours (which may also include seminars, tutorials, workshops and other contact time) are approximate and may include in-class tests where one or more of these are an assessment on the module. In-class tests are scheduled/organised separately to taught content and will be published on to student personal timetables, where they apply to taken modules, as soon as they are finalised by central administration. This will usually be after the initial publication of the teaching timetable for the relevant semester.

Reading list

https://readinglists.surrey.ac.uk
Upon accessing the reading list, please search for the module using the module code: BMS3063

Other information

BMS3063 is designed to allow students to develop knowledge, skills and capabilities in the following areas:

Employability:

The module will enhance employability through knowledge of subject area, problem solving and critical analysis skills - key to employment and success in the professional workplace.

Digital Capabilities:

Use of various platforms such as Zoom, Panopto and MS Teams for online interaction and review of content. High content of digital external resources to support lectures. Review of websites or databases of relevance to topic, such as the International Agency for Research in Cancer (IARC) and the COSMIC database of human cancer mutations.

Global and Cultural Capabilities:

Lecture content covers multiple cancer types with differences in aetiology/incidence depending on ethnic groups/global location. Research examples from a range of countries and cultures are highlighted during the module.

Sustainability:

In line with OneHealth approach the module works towards relevant Sustainable Development Goals (SDGs) like SDG3 (health).

Resourcefulness and Resilience:

Self directed flipped learning supported by active learning tutorials. Background research for exam preparation. Independent research complements in-class learning via lectures and tutorials. Provision of student feedback and consultation hours to discuss attainment and progress in the module.

Programmes this module appears in

Programme	Semester	Classification	Qualifying conditions
Biochemistry BSc (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Biochemistry MSci (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Biological Sciences (Cellular and Molecular Sciences) BSc (Hons)	2	Compulsory	A weighted aggregate mark of 40% is required to pass the module
Biological Sciences (Infection and Immunity) BSc (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Biological Sciences BSc (Hons)	2	Optional	A weighted aggregate mark of 40% is required to pass the module
Microbiology BSc (Hons)	2	Compulsory	A weighted aggregate mark of 40% is required to pass the module

Please note that the information detailed within this record is accurate at the time of publishing and may be subject to change. This record contains information for the most up to date version of the programme / module for the 2024/5 academic year.