

Module specification

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Module code	SCI646
Module title	Clinical Genetics & Cancer Biology
Level	5
Credit value	20
Faculty	FSLS
HECoS Code	100265
Cost Code	GANG

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BSc (Hons) Biomedical Science	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	30 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	30 hrs
Placement / work based learning	0 hrs
Guided independent study	170 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	21 April 2021
With effect from date	September 2023
Date and details of revision	01/08/2024 Derogation update
Version number	2

Module aims

The module aims to focus on clinical and current research topics in genetics and cancer biology.

Specifically, the module will allow students to develop an understanding of modern techniques for identification and study of genes involved in human disease; to study the pathology of significant human inherited genetic disorders; to evaluate the potential and actual use of techniques of genetic screening and human gene therapy; to provide a description and explanation of the characteristics of tumour cells; to identify oncogenes and tumour suppressor genes and their impact on cell signalling and proliferation; demonstrate an understanding of the epigenetics of cancer; the utility of cytogenetics and sequencing technologies in cancer diagnosis and precision medicine.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Critically evaluate the impact of genetic variants on human disease including selected Mendelian, chromosomal, and multifactorial disorders.
2	Evaluate the current methodologies for identification of genetic variants and the ethics of genetic testing in clinical practice.
3	Discuss the aetiology, pathogenesis, laboratory findings and clinical presentation of cancer.
4	Assess the characteristics of tumour cells; to identify oncogenes and tumour suppressor genes and their impact on cell signalling and proliferation.
5	Analyse the epigenetics of cancer; the utility of cytogenetics in cancer diagnosis and precision medicine, including current research in cancer biology.

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Assessment 1 (40%): Coursework (40%, 1600 word equivalent), assessing aspects of learning outcomes 4-5.

Assessment 2 (60%): Examination – 2 hours (60%, 2400 word equivalent), assessing aspects of learning outcomes 1-3.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	4-5	Coursework	40%

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
2	1-3	Examination	60%

Derogations

All elements of assessment for this module must be passed at or above 40%. Compensation for failure is not permitted for this module and other “core” biomedical science modules across the programme.

Learning and Teaching Strategies

The module will comprise of lectures, seminars and computer assisted learning (incorporating digital imaging). Appropriate use will be made of text and electronic resources (VLE).

Formative assessment will be provided in dedicated seminar sessions focussing on case study analysis. Students will be expected to attend all timetabled sessions

Indicative Syllabus Outline

- Chromosomal aberrations and genetic disease (e.g. cystic fibrosis, Down's syndrome, haemoglobinopathies, etc.)
- Genetics of Common Diseases
- Genomics and Personalised Medicine
- Introduction to gene therapy
- Ethical issues associated with human genetic information
- Biological characteristics of tumour cells
- Genetic and environmental factors in the origins of tumours
- Cell culture models and carcinogenesis as a multi-step process
- Identification of oncogenes and tumour suppressor genes and their impact on cell signalling and proliferation
- Epigenetics of cancer
- Cancer diagnosis; current cancer treatment strategies and rational approaches for novel therapeutics

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

Read, A. P. (2015). *New clinical genetics*. (3rd edition.). Scion Publishing.

Other indicative reading

Ahmed, N., Dawson, M., Smith, C., & Wood, E. (2007). *Biology of disease*. New York: Taylor & Francis Group.

Jorde, L., Carey, J., & Bamshad, M. (2019). *Medical genetics*. (6th ed.). Elsevier.

Korf, B. R. & Irons, M. B. (2013). *Human genetics and genomics*. (4th edition). Chichester: Wiley-Blackwell.

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

Core Attributes

Engaged
Enterprising
Creative
Ethical

Key Attitudes

Commitment
Curiosity
Resilience
Confidence
Adaptability

Practical Skillsets

Digital Fluency
Organisation
Leadership and Team working
Critical Thinking
Emotional Intelligence
Communication