

Module Information

2022.01, Approved

Summary Information

Module Code	5105BCBMOL
Formal Module Title	Molecular Biology and Functional Genomics
Owning School	Pharmacy & Biomolecular Sciences
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Pharmacy & Biomolecular Sciences

Learning Methods

Learning Method Type	Hours
Lecture	40
Practical	6
Workshop	10

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	To provide a detailed understanding of the molecular mechanisms that are applicable to human disease states, development, genetic engineering, high-throughput technologies, and to introduce and develop bioinformatics practical skills.
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After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Discuss the mechanisms of DNA damage and repair and their contribution to human genetic disease.
MLO2	2	Review the principles of the genetic control of development.
MLO3	3	Demonstrate an understanding of genetic engineering.
MLO4	4	Apply knowledge of the principles, challenges, and applications for Next Generation Sequencing.

Module Content

Outline Syllabus	DNA damage and repair and its impact in human disease states (using a range of biochemical examples which may include: Huntington's, Fragile -X, Xeroderma pigmentosum, etc.). Translational control and gene silencing (introduce NMD, microRNA and RNAi). Developmental biology and genetic programs (basic embryology and genetics). Introduction to genetic engineering. Experimental considerations for NGS experiments (feasibility, reproducibility, bias, error and limitations). Introduction to bioinformatics/omics – (genomics, epigenome, transcriptome, microbiome, and proteomics) and next generation sequencing technologies, GWAS and gene knock-outs/ins. Introduction to cancer genetics.
Module Overview	This module provides you with a detailed understanding of the molecular mechanisms that are applicable to human disease states, development and genetic engineering. The module will empower you to demonstrate a critical understanding of genomic integrity and human disease. Transcriptional control, developmental biology, genetic engineering and bioinformatics will be introduced. You will encounter experimental methods for the investigation of the relevant areas of biochemistry and molecular biology using data from high-throughput techniques.
Additional Information	This module will empower students to demonstrate a critical understanding of genomic integrity and human disease. Transcriptional control, developmental biology, genetic engineering and bioinformatics will be introduced. Students will encounter experimental methods for the investigation of the relevant areas of biochemistry and molecular biology using data from high-throughput techniques.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Report	Analysis of data report	40	0	MLO4
Centralised Exam	Examination	60	2	MLO1, MLO2, MLO3

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Giles Watts	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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