

Liverpool John Moores University

Title: MICROBIAL GENETICS
Status: Definitive
Code: **5001MBBMOL** (101564)
Version Start Date: 01-08-2011

Owning School/Faculty: Pharmacy & Biomolecular Sciences
Teaching School/Faculty: Pharmacy & Biomolecular Sciences

Team	Leader
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Academic Level: FHEQ5 **Credit Value:** 12.00 **Total Delivered Hours:** 31.50
Total Learning Hours: 120 **Private Study:** 88

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	18.000
Practical	11.000
Workshop	1.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1		60.0	1.50
Report	AS2		40.0	

Aims

To consider fundamental principles of microbial genetics with reference to bacteria, bacteriophages and fungi and to examine mechanisms of genetic variation in microorganisms, concentrating on mutation and the transmission of genetic material.

Learning Outcomes

After completing the module the student should be able to:

- 1 Discuss the nature, organisation and maintenance of genetic material in microorganisms, and the mechanisms governing its expression.
- 2 Appreciate the molecular basis of mutation and the value of microbial mutants in analysing genetic processes.
- 3 Discuss the molecular mechanisms of recombination and recognize their significance in microbial populations.
- 4 Discuss microbial gene transfer processes and their uses in genetic analysis.
- 5 Summarise basic gene cloning techniques and construct both physical and genetic maps of genomes.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAM	1	2	3	4	5
Practical report	1	2	4	5	

Outline Syllabus

Nature and function of genetic material: chromosomal and plasmid DNA. Gene expression: e.g. transcription and translation; regulation of gene expression. Mutation and recombination: e.g. types of mutation; mutagens, transposable genetic elements; in vivo and in vitro mutagenesis. Genetic complementation. Genetic suppression. Genetic recombination.

Bacterial and phage genetics: e.g. transmission of genetic material, transformation, generalized and specialized transduction, and conjugation in bacteria; genetic mapping; strain construction. Lytic and lysogenic cycles in phage; regulation of gene expression during phage infection.

Fungal genetics: e.g. sexual cycle, tetrad analysis, gene conversion. Parasexual cycle and its use in genetic analysis.

Recombinant DNA technology: e.g. restriction endonucleases; restriction mapping; gene cloning; Polymerase Chain Reaction (PCR).

Learning Activities

Lectures, practicals, workshops and student-centred activities.

References

Course Material	Book
Author	Brown T A
Publishing Year	2006
Title	Gene Cloning and DNA Analysis

Subtitle	
Edition	5th ed
Publisher	Blackwell
ISBN	1405111216

Course Material	Book
Author	Dale J W, Park S F.
Publishing Year	2004
Title	Molecular genetics of bacteria
Subtitle	
Edition	4th ed
Publisher	Wiley
ISBN	0-47085085

Course Material	Book
Author	Malacinski G M.
Publishing Year	2003
Title	essentials of Molecular Biology
Subtitle	
Edition	4th ed
Publisher	Jones and Bartlett
ISBN	0-763721336

Course Material	Book
Author	Snustad D P and Simmons M J.
Publishing Year	2005
Title	Principles of genetics
Subtitle	
Edition	4thed
Publisher	Wiley
ISBN	0-471-69939-X

Course Material	Book
Author	Additional references will be provided in the module reading list.
Publishing Year	0
Title	
Subtitle	
Edition	
Publisher	
ISBN	

Notes

Microbial Genetics considers classical and modern genetics techniques and principles with reference to bacteria, bacteriophages and fungi. Emphasis is placed

on mutagenesis, gene transfer and the control of gene expression. Genetic complementation, suppression and recombination are also discussed, together with basic techniques of molecular cloning.

The module provides opportunities to develop graduate skills including: analysing and solving problems, numeracy, written and oral communication, time management and initiative, as well as subject-specific and technical skills.