

Liverpool John Moores University

Title: MOLECULAR BIOLOGY
Status: Definitive
Code: **5003BCBMOL** (101434)
Version Start Date: 01-08-2011

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

Team	Leader
Patricia Burke	Y
Kehinde Ross	
Mark Murphy	
Janice Harland	
Colin Reynolds	

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	7.500
Tutorial	4.500

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	1 question from each section, total 3 essays.	60.0	1.50
Practice	AS2	Practical coursework (2 written assignments)	40.0	

Aims

To provide a more detailed understanding of the molecular mechanisms of replication and gene control in eukaryotic organisms and to introduce some basic

methodologies associated with gene cloning.

Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate familiarity with the latest models for DNA replication and RNA synthesis and regulation in eukaryotes,
- 2 Demonstrate awareness of the range of structural properties associated with DNA and RNA.
- 3 Understand some of the basic techniques and applications of recombinant DNA technology.
- 4 Demonstrate familiarity with the mechanisms involved in generating and repairing mutations in eukaryotes and some of the consequences of unrepaired mutations.
- 5 Demonstrate familiarity with the process of post-translational modification in eukaryotes.
- 6 Use of an online genetic database.

Learning Outcomes of Assessments

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

EXAM	1	2	3	4	5	6
In-class test	1	2	3	4	5	6

Outline Syllabus

Relationship of Molecular Biology to Eukaryotic Organisms

Structure and properties of Nucleic Acids (DNA/RNA). The eukaryotic cell cycle.

DNA replication of eukaryotes: Models of replication, continuous and discontinuous synthesis. Enzymology. Fidelity of replication. Telomeric DNA. Histone proteins and the replication process.

RNA synthesis in eukaryotes: General features of RNA polymerase II; post-transcriptional processing. Transcription factors.

Post-translational modification processes.

Aspects of gene cloning, plasmids, restriction endonucleases, modifying enzymes.

Mutagenesis and DNA repair. The relationship between genetic mutation and gene function. Glucose-6-phosphatase deficiency. Cystic fibrosis. Use of OMIM.

Learning Activities

Lectures, tutorials, practicals.

References

Course Material	Book
Author	Brown, T.A.
Publishing Year	1998
Title	Genetics - A Molecular Approach
Subtitle	
Edition	3rd Ed.
Publisher	Chapman and Hall.
ISBN	0412-37970-8.

Course Material	Book
Author	Brown, T.A.
Publishing Year	2007
Title	Genomes
Subtitle	3rd.
Edition	3rd ed
Publisher	Bios Scientific Publishers.
ISBN	18599-62017

Course Material	Book
Author	Berg, J.M., Tymoczko, J.L. and Stryer L.
Publishing Year	2002
Title	Biochemistry
Subtitle	
Edition	5th ed.
Publisher	Freeman
ISBN	0-7167-4684-0

Course Material	Book
Author	Cooper, G.M.
Publishing Year	2000
Title	The Cell, A Molecular Approach.
Subtitle	
Edition	2nd ed.
Publisher	ASM Press
ISBN	0878931061

Course Material	Book
Author	Lodish, H. and Darnell, J.
Publishing Year	1999
Title	Molecular Cell Biology.
Subtitle	
Edition	4th ed.
Publisher	Freeman
ISBN	0-71673706X

Course Material	Book
Author	Russell, P. J.

Publishing Year	2006
Title	i Genetics
Subtitle	
Edition	2nd ed
Publisher	Benjamin Cummings
ISBN	0-8053-4553-1

Notes

The emphasis of this module will be to build upon the basic concepts of eukaryotic molecular biology delivered in the level 1 biochemistry and cell biology modules. In addition, the enzymology and basic techniques used for eukaryotic gene cloning will be introduced.