London South Bank University

Module Guide

Advanced Molecular Biology

FBS-6-306

Faculty of Science, Engineering & Built Environment

2013-14

Level 6

Template version: 8

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1. MODULE DETAILS

Module Title:	Advanced Molecular Biology
Module Level:	6
Module Reference Number:	FBS-6-306
Credit Value:	1 Credit = 15 CATS Points
Student Study Hours:	150
Contact Hours:	36
Private Study Hours:	114
Pre-requisite Learning (If applicable):	Molecular Biology
Course(s):	Bioscience Programme
Year and Semester	2012-13, Semester 1
Module Coordinator:	Dr. J. Acord
MC Contact Details (Tel, Email, Room)	02078157922, acordj@lsbu.ac.uk, B140
Subject Area:	Bioscience
Summary of Assessment Method:	Coursework: 40%. Exam: 60%.

2. SHORT DESCRIPTION

Advanced molecular biology will further develop the ideas introduced in Molecular Biology. The course will focus on the applications of molecular biology in disease analysis, recombinant DNA and protein production and control of transcription and translation in both prokaryotic and eukaryotic systems.

3. AIMS OF THE MODULE

The aims of this unit are:

- To extend the knowledge of the students in molecular biology to the research level
- To convey a broad vision of the contribution of molecular biology to our knowledge of the functioning of diverse organisms from bacteria to man
- To show how molecular biology, when used in conjunction with other biological disciplines (e.g. biochemistry, cell biology, genetics), is steadily revealing the mechanisms of previously intractable problems (e.g. control of development).
- To teach critical analysis of original experimental data, thus providing the intellectual framework for students to be able to discuss the design of experiments and to justify conclusions that can be drawn.

4. LEARNING OUTCOMES

4.1 Knowledge and Understanding

- Have an advanced understanding of transcriptional and translational control in both microbial and higher eukaryotic systems.
- Understand and apply the techniques of producing recombinant DNA and proteins, and be able to separate and identify them using a range of molecular biology tools.
- Have learned up-to-date principles of experimental design and execution, as would be used at the present time by a world-class research laboratory.

4.2 Intellectual Skills

- Comprehend the experimental approaches and ideas presented in original scientific papers and review.
- Can critically analyse, appreciate and interpret such scientific data and ideas.
- Have acquired the study skills for life-long reading of the molecular biological literature and for keeping abreast of developments in the most topical areas of biology.

4.3 Practical Skills

While this course has no associated practical laboratory classes, students will be introduced to a number of advanced techniques in molecular biology through both lectures and primary literature.

4.4 Transferable Skills

Embarked on a continuing programme of acquisition of transferrable skills namely: numeracy, presentation skills, teamwork, individual study skills, time management and word processing skills.

5. ASSESSMENT OF THE MODULE

Assessment will be by a final unseen examination of 3 hours which will account for 60% of the module grade and coursework components which will account for the remaining 40%. The coursework will be formed of two elements each worth 20%. The first coursework will be a written critique of a current paper in molecular biology, and the second coursework an oral presentation of a current paper in molecular biology. Further details of these elements (including exact submission dates) will be presented in the class and can also be found on the associated Blackboard site for this module.
Please note: all coursework must be submitted using Turnitin and will be checked for plagiarism. Any piece of coursework scoring higher than 20% similarity will have failed to meet the module learning outcomes and will result in failure of that piece of coursework.

6. ATTENDANCE

Students MUST attend at least 80% of the lecture series to pass this module. Failure to attend at least 80% of the lecture series and/or failure to submit all coursework and/or failure to attend exams will result in an automatic failure of this module.
If you are unable to attend a lecture/exam or submit a coursework on time you MUST inform the module leader BY E-MAIL in a timely manner to discuss if alternative arrangements can be made.

7. FEEDBACK

Feedback will usually be given to students 15 working days after the submission of an assignment.

8. INTRODUCTION TO STUDYING THE MODULE

8.1 Overview of the Main Content

Advanced molecular biology will cover many areas of gene control and regulation and their effects in, for example, cancer or development. Advanced techniques in molecular biology will also be covered giving the student a thorough understanding of how processes are examined at the molecular level.

8.2 Overview of Types of Classes

The unit comprises 3 hours of formal lectures per week.

8.3 Importance of Student Self-Managed Learning Time

The formal lectures given in this module can convey only a small part of the information that you will be required to learn in order to do well in this unit. Purchase the core texts and take the time to read about the subject material covered in each weeks lectures. After each weeks lecture you should re-read your notes and supplement them with information from other sources (journal articles, core and supplementary texts, etc.) so that you know the subject matter in detail. Not only will this ensure that you are prepared for the final exam but it will also help with your preparation for the following weeks lecture. There is too much information in this module for you to successfully revise in a couple of weeks before the final exam – if you wish to do well you are advised to manage your learning time efficiently.

8.4 Employability

Molecular biology impacts heavily on almost all areas of the biosciences. An understanding of advanced techniques in molecular biology will provide the skills essential for employment in the bioscience/biotechnology field.

9. THE PROGRAMME OF TEACHING, LEARNING AND ASSESSMENT

Week 1: Elements of eukaryotic gene regulation

Week 2: Role of chromatin structure in gene control

Week 3: Post-transcriptional regulation

Week 4: Homologous recombination

Week 5: DNA damage & repair

Week 6: Transposition & V(D)J recombination

Week 7: Molecular biology techniques

Week 8: Molecular genetics of bacteriophage lambda

Week 9: RNA interference

Week 10: Cell signalling

Week 11: Molecular biology of *Drosophila* development

Week 12: Student presentations

PLEAS NOTE: The lecture series above is for information only, and the series of lectures may be subject to change.

10. LEARNING RESOURCES

10.1 Core Materials

- Watson, J. D. *et al* (2008) *Molecular Biology of the Gene.* 6th Edition. Pearson.
- Latchman, D. S. (2010) *Gene Control*. Garland Science.
- Weaver, R. F. (2007) *Molecular Biology.* 4th Edition. McGraw-Hill.
- Alberts, B. *et al* (2008) *Molecular Biology of the Cell*. 5th Edition. Garland Science.

10.2 Optional Materials

- Karp, G. (2007) *Cell and Molecular Biology: Concepts and Experiments.* 5th Edition. Wiley.
- Brown, T. A. (2010) *Gene Cloning and DNA Analysis: An Introduction.* 6th Edition. Wiley-Blackwell.
- Reed, R. *Et al* (2007) *Practical Skills in Biomolecular Sciences.* 3rd Edition. Benjamin Cummings.
- Dale, J. W. & Park S. F. (2004) *Molecular Genetics of Bacteria.* 4th Edition. Wiley.

NOTES

The blackboard site for this unit contains both essential information for the completion of the unit and also other optional material that may aid the student in their understanding of this subject. Students are expected to regularly check the blackboard site. It is also the student's responsibility to inform the unit leader if they do not have access to the site.