

BIOS 3027 MOLECULAR BIOLOGY OF THE CELL

Credit Points 10

Legacy Code 301251

Coordinator Liza Cubeddu ([https://directory.westernsydney.edu.au/search/name/Liza Cubeddu/](https://directory.westernsydney.edu.au/search/name/Liza%20Cubeddu/))

Description Molecular biology is central to many fields of the biomedical and natural sciences, and includes genetics, immunology, cell biology, biochemistry, and forensics. Through comparative studies of different organisms, this Unit will explain fundamental concepts and methods in the study of DNA and RNA, extending to the application of molecular biology in more advanced fields such as genomics. Subjects will include DNA replication; transcriptional, post-transcriptional and epigenetic regulation of gene expression; microarrays, and an introduction to bioinformatics. Practical work will provide opportunities to become familiar with the methods of molecular biology, with an emphasis on the development of problem solving and analytical skills. Students may be required to travel to a different campus to undertake this unit.

School Science

Discipline Biochemistry and Cell Biology

Student Contribution Band HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 3 subject

Pre-requisite(s) BIOS 2014 OR BIOS 2018

Incompatible Subjects BIOS 3015 Human Molecular Biology
BIOS 2026 Molecular Biology

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Recall common terms and definitions of molecular biology
2. Explain how genomes are organised and how this relates to the control of gene expression.
3. Describe mechanisms of transcriptional and post-transcriptional gene regulation
4. Compare and contrast common approaches to analyse DNA and RNA at the level of a single gene and of a whole genome.
5. Plan, complete and become proficient in conducting experiments in molecular biology.
6. Communicate and problem solve experiments as part of a laboratory group.
7. Demonstrate skills in critical thinking and analysis.

Subject Content

Theme 1: Working with DNA and RNA

- The structure and organisation of DNA and RNA: relating form to function
- What is a gene? Locating genes within a genome and in different organisms
- The organisation of genome
- The theory and practice of cloning

Theme 2: Synthesis of DNA, RNA and Protein

- DNA Synthesis (Replication) and DNA replication- Termination of replication and role of telomerase
- RNA Synthesis (Transcription)
- RNA processing
- The genetic code
- Protein synthesis (Translation)

Theme 3: Controlling the genome ? DNA repair and the regulation of transcription

- The regulation of gene expression: Nucleosome modification and Chromatin remodelling
- Types of mutations
- DNA repair pathways
- Homologous recombination and its importance in DNA repair and meiosis

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/ Group Task
Online multiple choice quiz (online problem solving)	1 hour	15	N	Individual
Laboratory Practical Component and Critical Analysis	1,500 words	45	N	Individual
Final Exam Written, with multiple choice	2 hour	40	N	Individual

Prescribed Texts

- Michael M. Cox, Jennifer A. Doudna, Michael O'Donnell, (2015) Molecular Biology- Principles and Practice, 2nd Edition W. H. Freeman, New York

Teaching Periods

Spring Campbelltown Day

Subject Contact Liza Cubeddu ([https://directory.westernsydney.edu.au/search/name/Liza Cubeddu/](https://directory.westernsydney.edu.au/search/name/Liza%20Cubeddu/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=BIOS3027_22-SPR_CA_D#subjects)

Parramatta - Victoria Rd

Day

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