



Course Outline (Higher Education)

School:	School of Science, Psychology and Sport
Course Title:	MOLECULAR CELL BIOLOGY
Course ID:	SCMOL3001
Credit Points:	15.00
Prerequisite(s):	SCBCH2001
Co-requisite(s):	Nil
Exclusion(s):	SCMED2031
ASCED:	010901

Description of the Course:

The course examines the pathways by which cells receive external information and process this into specific biochemical responses. We begin with a survey of different mechanisms of cellular signalling and their roles in `normal` cellular activities and overall homeostasis. A diverse set of cellular processes is studied and the normal control mechanisms highlighted. This is followed by investigation of the dysfunction of signalling mechanisms in several disease states. The course will also explore the use of advanced recombinant DNA technologies in research and diagnostics. The latest methods for investigating gene and protein function, gene therapy, virus detection and typing, recombinant vaccine production and personalized medicine will be explored.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Introductory	■	■	■	■	■	■

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Intermediate	■	■	■	■	■	■
Advanced	■	■	✓	■	■	■

Learning Outcomes:

Knowledge:

- K1.** Describe the function of a range of cell-cell communication processes.
- K2.** Describe how signalling events regulate the normal function of the healthy body.
- K3.** Recognise the role of signalling dysfunction in a range of pathological states.
- K4.** Explain the molecular basis of a wide range of diagnostic and research techniques.

Skills:

- S1.** Develop scientific problem solving and investigation skills.
- S2.** Devise strategies to search for and critically analyse relevant scientific literature.
- S3.** Demonstrate proficiency in the interpretation of data acquired by molecular biological techniques.

Application of knowledge and skills:

- A1.** Appraise current scientific problems in industry, medicine and research and devise strategies to solve them.
- A2.** Critically evaluate and compare approaches to a particular scientific or industrial problem.

Course Content:

Topics may include:

- Structure and function of eukaryotic cells and organelles review.
- Trafficking between cellular compartments review.
- Cell signalling and signal transduction.
- Advanced regulation of gene expression: RNAi, epigenetics.
- Endocrine control of cellular processes.
- The cell cycle, apoptosis and cell death.
- Pathogenesis associated with dysfunctional states.
- Advanced molecular diagnostics: including high throughput sequencing, transcriptome analysis RT-PCR and microarray technology.
- Proteomics and metabolomics.

Values:

- V1.** Appreciate the importance of cellular communication in health and disease.
- V2.** Appreciate the medical and society benefits of the use advanced molecular diagnostics.
- V3.** Appreciate the complexity and diversity of cellular communication.
- V4.** Develop an increased awareness of the environmental, social, ethical, legal and economic implications of decisions involving principles of biotechnology.
- V5.** Adopt a professional and ethical approach to research and work.

Graduate Attributes

The Federation University FedUni graduate attributes (GA) are entrenched in the [Higher Education Graduate](#)

[Attributes Policy](#) (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K4, S1-S3, A1 & A2	AT-1-3
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	A1, A2, S2	AT-2, AT-3
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	A1, A2	Not applicable
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K1-K4	AT-2
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	A1, A2	AT-1, AT-2, AT-3

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1, K2, K3, K4, S1, S2, A2	Quizzes testing the retention and comprehension of knowledge for each topic	Multiple Choice Quiz	30-50%
K1, K3, S1, S3	Synthesis and comprehension of signalling mechanisms. Explore the molecular effects of toxins and medicines.	Written and/or oral report.	20-30%
K1, K2, K3, K4, A1, A2	Students will be examined on their knowledge and synthesis of understanding of all topics throughout semester.	Online Test	30-50%

Adopted Reference Style:

Australian Harvard

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)