



MEDI3200

Translational Biology and Genomics

Session 1, In person-scheduled-weekday, North Ryde 2022

Medicine, Health and Human Sciences Faculty level units

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General Information

Unit convenor and teaching staff

Albert Lee

albert.lee@mq.edu.au

Contact via email

Consultation by appointment

Credit points

10

Prerequisites

140cp at 1000 level or above including [(CBMS104 or BMOL1001) and (MEDI219 or MEDI2200)] or [(CBMS107 or CHEM1001) and (BIOL206 or BIOL2110) and (CBMS202 or BMOL2401) and (MEDI2201)]

Corequisites

Co-badged status

Unit description

This unit represents the final unit in the Biochemistry stream of units within the Bachelor of Clinical Science. Key concepts in genetics, cell biology and biochemistry, which are fundamental to our understanding of human biology, diseases and medicine are examined. You will learn about signal transduction, cytoskeletal dynamics, mitochondrial dysfunction, protein metabolism, stem cells and molecular targeted therapies. You will explore cellular pathways and processes involved in cellular homeostasis, and perturbations and defects that lead to disease (e.g. cancer and neurodegenerative disorders). You will participate in practical classes that complement the lecture series and allow you to consolidate and apply conceptual elements to help shape your understanding. You will be required to use laboratory techniques including analysis of signalling cascades, and microscopy.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Describe the major cellular pathways that regulate biological processes and homeostasis.

ULO2: Outline the different concepts, mechanisms, and checkpoints involved in cancer and neurodegenerative diseases.

ULO3: Evaluate the current topics in molecular and cellular biology and genomics.

ULO4: Design and carry out experiments to characterise and measure a range of cellular processes and consolidate aspects of theory and practical.

ULO5: Extract scientific information from publications, critically and collaboratively analyse and communicate findings in a verbal and written context.

General Assessment Information

Grade descriptors and other information concerning grading are contained in the Macquarie University Assessment Policy, which is available at: <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/assessment>.

Further details for each assessment task will be available on iLearn.

All final grades in the Bachelor of Clinical Science are determined by a grading committee and are not the sole responsibility of the Unit Convenor.

To pass this unit, students must demonstrate sufficient evidence of achievement of the learning outcomes, attempt all assessment tasks, meet any ungraded requirements including professionalism and achieve final grade of 50 or better.

Student Professionalism

In the Faculty of Medicine, Health and Human Sciences, professionalism is a key capability embedded in all our courses. As part of developing professionalism, students are expected to attend all small group interactive sessions including tutorials, as well as clinical- and laboratory-based practical sessions.

Furthermore, lectures and seminars are key learning activities that you are expected to attend throughout completion of the Bachelor of Clinical Science. While audio recordings and lecture slides may be made available following these large group sessions, it is important to recognise that such resources are a study aid - and should not be considered an alternative to lecture or seminar attendance.

Students are expected to attend a minimum of 80% of all small group interactive sessions. If you are unable to attend a small group activity, please refer to the iLearn site regarding further action.

Similarly, as part of developing professionalism, students are expected to submit all work by the due date. Applications for assessment task extensions must be supported by appropriate evidence and submitted via www.ask.mq.edu.au. For further details please refer to the Special Consideration Policy available at <https://students.mq.edu.au/study/my-study-program/special-consideration>.

Late Submission

Late submissions will receive a 5% per day penalty including weekends and public holidays. If you submit the assessment task 10 days or more beyond the due date, without an approved extension, you will be awarded a maximum of 50% of the overall assessment marks. For example:

Due date	Received	Days late	Deduction	Raw mark	Final mark
Friday 14th	Monday 17th	3	15%	75%	60%

Assessment Tasks

Name	Weighting	Hurdle	Due
Ongoing Weekly Quizzes	15%	No	Ongoing
Laboratory Report and Assignments	35%	No	Week 7, 9, 13
Final examination	50%	No	Exam period

Ongoing Weekly Quizzes

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 10 hours

Due: **Ongoing**

Weighting: **15%**

Weekly multiple choice and short answer quizzes to assess lecture content.

On successful completion you will be able to:

- Describe the major cellular pathways that regulate biological processes and homeostasis.
- Outline the different concepts, mechanisms, and checkpoints involved in cancer and neurodegenerative diseases.
- Evaluate the current topics in molecular and cellular biology and genomics.

Laboratory Report and Assignments

Assessment Type ¹: Lab report

Indicative Time on Task ²: 30 hours

Due: **Week 7, 9, 13**

Weighting: **35%**

A three part assessment that includes (1) the group submission of a short scientific report that contextualises the experimental observations and results acquired during practical classes; (2) submission of an individual bioinformatics assignment; and (3) submission of an individual laboratory report that documents accurately and comprehensively all work undertaken within the practical classes.

On successful completion you will be able to:

- Describe the major cellular pathways that regulate biological processes and homeostasis.
- Outline the different concepts, mechanisms, and checkpoints involved in cancer and neurodegenerative diseases.
- Evaluate the current topics in molecular and cellular biology and genomics.
- Design and carry out experiments to characterise and measure a range of cellular processes and consolidate aspects of theory and practical.
- Extract scientific information from publications, critically and collaboratively analyse and communicate findings in a verbal and written context.

Final examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 30 hours

Due: **Exam period**

Weighting: **50%**

The final exam will be composed of a mixture of questions that include MCQs, short and long answer questions. All content will be assessed.

On successful completion you will be able to:

- Describe the major cellular pathways that regulate biological processes and homeostasis.
- Outline the different concepts, mechanisms, and checkpoints involved in cancer and neurodegenerative diseases.
- Evaluate the current topics in molecular and cellular biology and genomics.
- Design and carry out experiments to characterise and measure a range of cellular

processes and consolidate aspects of theory and practical.

- Extract scientific information from publications, critically and collaboratively analyse and communicate findings in a verbal and written context.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Technology Used

Active participation in the learning activities throughout the unit will generally require students to have access to a tablet, laptop or similar device. Students who do not own their own laptop computer may borrow one from the university library.

Required Unit Materials

All students are required to wear closed shoes and a lab coat/gown to attend practical classes.

Recommended Readings

Unit readings for this unit are available via the iLearn and university library website.

The prescribed textbook for this unit is

Lodish, H (2021) *Molecular Cell Biology* (9th Edition) Macmillan Learning OR

Alberts, B. (2014) *Molecular Biology of the Cell* (6th Edition). Garland Science

Other recommended texts (available at the library)

1. Alberts, B (2014) *Essential Cell Biology* (4th Edition) Garland Science
2. Weinberg, R.A. (2014) *The Biology of Cancer* (2nd Edition) Garland Science.
3. Marks, F. (2009) *Cellular Signal Processing: An Introduction to the Molecular Mechanisms of Signal Transduction*. Garland Science .
4. Zlatanova, J (2016) *Molecular Biology: Structure and Dynamics of Genomes and Proteomes*. Garland Science

Unit Schedule

Week	Lecture Topic	Delivered by	Tutorial	Practical	Assessment
1	Overview, Cell Signaling Basics, Techniques in biology	Albert Lee/ iLearn	Tutorial 1 (Stream A)	Practical 1 (Stream B)	Online Quiz
2	Genetics, Genomics and Genetic Therapies	Jenn Fifita	Tutorial 1 (Stream B)	Practical 1 (Stream A)	Online Quiz
3	Cell Cycle dysregulation in cancer	Lucinda McRobb	Tutorial 2 (Stream A)	Practical 2 (Stream B)	Online Quiz
4	DNA damage and repair	Lucinda McRobb	Tutorial 2 (Stream B)	Practical 2 (Stream A)	Online Quiz
5	Signaling pathways in health and disease	Esther Lim	Tutorial 3 (Stream A)	Practical 3 (Stream B)	Online Quiz
6	Apoptosis and Necrosis Cell survival pathways (UPS and autophagy)	Albert Lee/ Shu Yang	Tutorial 3 (Stream B)	Practical 3 (Stream A)	Online Quiz
7	Transcription regulation, RNA processing and Transcriptomics in human disease	Albert Lee	Tutorial 4 (Stream A)	Practical 4 (Stream B)	Online Quiz & Bioinformatics Assignment
	RECESS				
8	Protein Metabolism and Proteomics	Albert Lee	Tutorial 4 (Stream B)	Practical 4 (Stream A)	
9	Mitochondrial dysfunction and antioxidant therapies	Albert Lee	Tutorial 5 (Stream A)	Practical 5 (Stream B)	Group Lab Report
10	Transgenic animals	Marco Morsch	Tutorial 5 (Stream B)	Practical 5 (Stream A)	
11	Neuroprotection and Microglia Stem Cells and Regeneration Therapies	Roger Chung	Tutorial 6 (Stream A)	Practical 6 (Stream B)	
12	Translating basic discoveries to pharma and clinic	Albert Lee	Tutorial 6 (Stream B)	Practical 6 (Stream A)	
13	Revision	Albert Lee	Revision		Lab book

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)

- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)

Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.