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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https://unitguides.mq.edu.au/unit_offerings/149620/unit_guide/print
## General Information

**Unit convenor and teaching staff**
Albert Lee  
[albert.lee@mq.edu.au](mailto: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](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:

<table>
<thead>
<tr>
<th>Due date</th>
<th>Received</th>
<th>Days late</th>
<th>Deduction</th>
<th>Raw mark</th>
<th>Final mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday 14th</td>
<td>Monday 17th</td>
<td>3</td>
<td>15%</td>
<td>75%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing Weekly Quizzes</td>
<td>15%</td>
<td>No</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Laboratory Report and Assignments</td>
<td>35%</td>
<td>No</td>
<td>Week 7, 9, 13</td>
</tr>
<tr>
<td>Final examination</td>
<td>50%</td>
<td>No</td>
<td>Exam period</td>
</tr>
</tbody>
</table>

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
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


Other recommended texts (available at the library)

## Unit Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture Topic</th>
<th>Delivered by</th>
<th>Tutorial</th>
<th>Practical</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview, Cell Signaling Basics, Techniques in biology</td>
<td>Albert Lee/ iLearn</td>
<td>Tutorial 1 (Stream A)</td>
<td>Practical 1 (Stream B)</td>
<td>Online Quiz</td>
</tr>
<tr>
<td>2</td>
<td>Genetics, Genomics and Genetic Therapies</td>
<td>Jenn Fifita</td>
<td>Tutorial 1 (Stream B)</td>
<td>Practical 1 (Stream A)</td>
<td>Online Quiz</td>
</tr>
<tr>
<td>3</td>
<td>Cell Cycle dysregulation in cancer</td>
<td>Lucinda McRobb</td>
<td>Tutorial 2 (Stream A)</td>
<td>Practical 2 (Stream B)</td>
<td>Online Quiz</td>
</tr>
<tr>
<td>4</td>
<td>DNA damage and repair</td>
<td>Lucinda McRobb</td>
<td>Tutorial 2 (Stream B)</td>
<td>Practical 2 (Stream A)</td>
<td>Online Quiz</td>
</tr>
<tr>
<td>5</td>
<td>Signaling pathways in health and disease</td>
<td>Esther Lim</td>
<td>Tutorial 3 (Stream A)</td>
<td>Practical 3 (Stream B)</td>
<td>Online Quiz</td>
</tr>
<tr>
<td>6</td>
<td>Apoptosis and Necrosis Cell survival pathways (UPS and autophagy)</td>
<td>Albert Lee/ Shu Yang</td>
<td>Tutorial 3 (Stream A)</td>
<td>Practical 3 (Stream B)</td>
<td>Online Quiz</td>
</tr>
<tr>
<td>7</td>
<td>Transcription regulation, RNA processing and Transcriptomics in human disease</td>
<td>Albert Lee</td>
<td>Tutorial 4 (Stream A)</td>
<td>Practical 4 (Stream B)</td>
<td>Online Quiz &amp; Bioinformatics Assignment</td>
</tr>
</tbody>
</table>

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| 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). 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). 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) 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.