



# MEDI304

## Advanced Clinical Science

S2 Day 2019

*Medicine and Health Sciences Faculty level units*

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#### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

## General Information

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Credit points

3

Prerequisites

Admission to BClinSc and ((39cp at 100 level or above) including CBMS104 and MEDI303 and (MEDI209 or MEDI219))

### Corequisites

### Co-badged status

### Unit description

This unit introduces key concepts in cell biology and biochemistry that are fundamental to our understanding of human biology, diseases and medicine. 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 diseases (e.g. cancer and neurodegenerative disorders). You will participate in practical classes that complement the lecture material 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:

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

Outline the different concepts, mechanisms, and checkpoints involved in disease

Demonstrate an understanding of current topics in molecular and cell biology

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

## General Assessment Information

Grade descriptors and other information concerning grading are contained in Schedule 1 of 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.

Students will be awarded a final grade plus a Standardised Numerical Grade (SNG). The SNG is not necessarily a summation of the individual assessment components. The final grade and SNG

that are awarded reflect the corresponding grade descriptor in the Grading Policy.

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 an SNG of 50 or better.

## Student Professionalism

In the Faculty of Medicine and Health 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 required to attend a minimum of 80% of all small group interactive sessions. Students that do not meet this requirement may be deemed unable to meet expectations regarding professionalism and may be referred for disciplinary action (which may include exclusion from assessments and unit failure).

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](http://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

All assignments which are officially received after the due date, and where no extension has been granted, will incur a deduction of 5% for the first day, and 5% for each subsequent day including the actual day on which the work is received. Weekends and public holidays are included. 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
<a href="#">Ongoing Weekly Quizzes</a>	10%	No	Week 1-7
<a href="#">Practical Assessment</a>	40%	Yes	Week 9 and 13

Name	Weighting	Hurdle	Due
<u>Final exam</u>	50%	No	Exam period

## Ongoing Weekly Quizzes

Due: **Week 1-7**

Weighting: **10%**

There will be 7 multiple choice quizzes (Weeks 1-7) as diagnostic assessment, with each quiz having a weighting of 2% (only the top 5 quizzes will be counted).

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 disease
- Demonstrate an understanding of current topics in molecular and cell biology

## Practical Assessment

Due: **Week 9 and 13**

Weighting: **40%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

The laboratory safety induction must be completed prior to attending the laboratory practical. The practical task contains in-class assessments which will run every 2nd week (starting Week 2) throughout the semester. Students will be assessed on the practicals. Students are expected to submit a group laboratory report (approx. 1500 words) in scientific format. The word count includes Introduction, Results and Discussion, and does not include the Methods and References. The group practical report will be due at the end of Week 9 and make up 20% of your mark

On completion of all practical exercises, students will have to submit their completed lab manuals (20%) by Week 13 and ensure all results and questions have been completed.

The Practical Assessment is a hurdle task that requires the satisfactory standard of participation and performance in this task.

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 disease
- Demonstrate an understanding of current topics in molecular and cell biology
- 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 exam

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 disease
- Demonstrate an understanding of current topics in molecular and cell biology

## 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

**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. Lodish, H (2016) *Molecular Cell Biology* (8th Edition) Macmillan Learning

3. Weinberg, R.A. (2014) *The Biology of Cancer* (2nd Edition) Garland Science.
4. Marks, F. (2009) *Cellular Signal Processing: An Introduction to the Molecular Mechanisms of Signal Transduction*. Garland Science .
5. 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 of the Unit. (ONLINE) Principles of Cell Signaling Cell Signaling Basics (ONLINE)	iLearn	No tutorial Week 1		Online Quiz
2	Techniques in biology	Albert Lee		Western Blot I	Online Quiz
3	Cell Cycle	Lucinda McRobb	Tutorial 1		Online Quiz
4	DNA damage and repair	Lucinda McRobb		Western Blot II	Online Quiz
5	Signaling pathways in health and disease	Esther Lim	Tutorial 2		Online Quiz
6	Transcription regulation and RNA processing	Albert Lee		Western Blot III	Online Quiz
7	Cell survival pathways	Shu Yang	Tutorial 3		Online Quiz
	RECESS				
8	Protein Metabolism	Albert Lee		Microscopy I	
9	Cytoskeleton	Russell Diefenbach	Tutorial 4		Group Lab Report
10	Mitochondrial Dynamics	Albert Lee		Microscopy II	
11	Cell Adhesion and Interaction	Vivek Gupta	Tutorial 5		
12	Neuroprotection, Stem Cells and Regeneration Therapies	Roger Chung		Microscopy III	
13	Basic to Translational Science and Pharmacology	Marina Santiago	Tutorial 6		Individual Lab Manual

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>). 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](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

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

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/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](https://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Student Support

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

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](https://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.



- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](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.

## Graduate Capabilities

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

### Learning outcomes

- Describe the major cellular pathways that regulate biological processes and homeostasis.
- Outline the different concepts, mechanisms, and checkpoints involved in disease
- Demonstrate an understanding of current topics in molecular and cell biology
- 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

### Assessment tasks

- Ongoing Weekly Quizzes

- Practical Assessment
- Final exam

## Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

### Learning outcomes

- Demonstrate an understanding of current topics in molecular and cell biology
- 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

### Assessment tasks

- Practical Assessment
- Final exam

## Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

### Learning outcomes

- Describe the major cellular pathways that regulate biological processes and homeostasis.
- Outline the different concepts, mechanisms, and checkpoints involved in disease
- Demonstrate an understanding of current topics in molecular and cell biology
- 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

## Assessment tasks

- Ongoing Weekly Quizzes
- Practical Assessment
- Final exam

## Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

## Learning outcomes

- Describe the major cellular pathways that regulate biological processes and homeostasis.
- Outline the different concepts, mechanisms, and checkpoints involved in disease
- Demonstrate an understanding of current topics in molecular and cell biology
- 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

## Assessment tasks

- Ongoing Weekly Quizzes
- Practical Assessment
- Final exam

## Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

## Learning outcomes

- Describe the major cellular pathways that regulate biological processes and homeostasis.
- Outline the different concepts, mechanisms, and checkpoints involved in disease
- Demonstrate an understanding of current topics in molecular and cell biology
- 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

## Assessment tasks

- Ongoing Weekly Quizzes
- Practical Assessment
- Final exam

## Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

## Learning outcomes

- Describe the major cellular pathways that regulate biological processes and homeostasis.
- Outline the different concepts, mechanisms, and checkpoints involved in disease
- Demonstrate an understanding of current topics in molecular and cell biology
- 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

## Assessment tasks

- Ongoing Weekly Quizzes
- Practical Assessment
- Final exam

## Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

### Learning outcomes

- Describe the major cellular pathways that regulate biological processes and homeostasis.
- Outline the different concepts, mechanisms, and checkpoints involved in disease
- Demonstrate an understanding of current topics in molecular and cell biology
- 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

### Assessment tasks

- Ongoing Weekly Quizzes
- Practical Assessment
- Final exam

## Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

### Learning outcomes

- Describe the major cellular pathways that regulate biological processes and homeostasis.
- Outline the different concepts, mechanisms, and checkpoints involved in disease
- Demonstrate an understanding of current topics in molecular and cell biology
- 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

## **Assessment tasks**

- Ongoing Weekly Quizzes
- Practical Assessment
- Final exam

## **Socially and Environmentally Active and Responsible**

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

## **Learning outcomes**

- Demonstrate an understanding of current topics in molecular and cell biology
- Extract scientific information from publications, critically and collaboratively analyse and communicate findings in a verbal and written context

## **Assessment tasks**

- Practical Assessment
- Final exam

## **Changes since First Published**

Date	Description
01/08/2019	The description for AT2 has been modified to include additional words to indicate that practicals contain in-class assessments.