



MEDI3200

Translational Biology and Genomics

Session 2, In person-scheduled-weekday, North Ryde 2026

Macquarie Medical School

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	3
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	4
<u>Delivery and Resources</u>	7
<u>Unit Schedule</u>	7
<u>Policies and Procedures</u>	8
<u>Artificial Intelligence Tools</u>	9
<u>Inclusion and Diversity</u>	10
<u>Professionalism</u>	10

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General Information

Unit convenor and teaching staff

Unit Convenor

Dr Shu Yang

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Consultation hours: By appointment.

Bachelor of Clinical Science Course Director

A/Prof. Mark Butlin

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Level 1, 75 Talavera Rd, Macquarie University.

Consultation hours: 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 (CBMS201 or BMOL2201) 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 and interpret key cellular pathways that regulate biological processes and homeostasis, and explain their relevance in disease contexts. (Capability 1: Scientist and Scholar)

ULO2: Critically evaluate contemporary issues in molecular and cellular biology and genomics, synthesising research evidence to inform diagnostic and therapeutic innovation. (Capability 1: Scientist and Scholar)

ULO3: Design, conduct, and analyse experiments to investigate cellular processes, integrating theoretical knowledge with practical skills to generate and interpret data. (Capability 2: Practitioner)

ULO4: Extract and critically analyse scientific information from publications, and communicate findings effectively through written, oral and collaborative formats. (Capability 4: Professional)

General Assessment Information

Grade descriptors and other information concerning grading are contained in the [Macquarie University Assessment Policy](#).

All final grades are determined by a grading committee, in accordance with the Macquarie University Assessment Policy, and are not the sole responsibility of the Unit Convenor.

Students will be awarded a final grade and a mark, which must correspond to the grade descriptors specified in the [Assessment Procedure](#).

To pass this unit, you must demonstrate sufficient evidence of achievement of the learning outcomes, meet any ungraded requirements, and achieve a final mark of 50 or better.

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

Short Extension

The Assessment Task table lists which assessments are eligible for a Short Extension. You can only apply for a Short Extension before the assessment due date. No reason or evidence is required. It will extend the due date by an additional 3 calendar days. You can only receive one Short Extension for each eligible assessment task. Short Extensions are not available if you have already received an IEAP Extension or Special Consideration for that assessment task.

Special Consideration

If you are unable to complete an assessment task on or by the specified date due to circumstances that are unexpected, unavoidable, significantly disruptive and beyond your control, you may apply for special consideration in accordance with the [Special Consideration Po](#)

licy. Applications for special consideration must be supported by appropriate evidence and submitted via connect.mq.edu.au.

Late Submissions

A 5% penalty (OF THE TOTAL POSSIBLE MARK) will be applied each day a written assessment is not submitted, up to the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11.55 pm. A 1-hour grace period is provided to students who experience a technical concern. Submission of assessments after 7 days can be accepted at the discretion of the unit convenor and may be taken into account in determining whether you have met the learning outcomes of the unit to support passing the unit. Days late will be calculated from the date listed in the Assessment Tasks table, or from the extended due date if a Short Extension or Special Consideration application is accepted.

For example:

Number of days (hours) late	Total Possible Marks	Deduction	Raw mark	Final mark
1 day (1-24 hours)	100	5	75	70
2 days (24-48 hours)	100	10	75	65
3 days (48-72 hours)	100	15	75	60
7 days (144-168 hours)	100	35	75	40
>7 days (>168 hours)	100	—	75	0

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Mid semester quiz	20%	No	Week 7	Individual	No	Observed
Laboratory Report	30%	No	09/10/2026	Individual	No	Open
Final examination	50%	No	Exam Period	Individual	No	Observed

Mid semester quiz

Assessment Type ¹: Examination

Indicative Time on Task ²: 10 hours

Due: **Week 7**

Weighting: **20%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

The mid semester quiz will include multiple choice and short answer quizzes to assess lecture content.

On successful completion you will be able to:

- Describe and interpret key cellular pathways that regulate biological processes and homeostasis, and explain their relevance in disease contexts. (Capability 1: Scientist and Scholar)
- Critically evaluate contemporary issues in molecular and cellular biology and genomics, synthesising research evidence to inform diagnostic and therapeutic innovation. (Capability 1: Scientist and Scholar)

Laboratory Report

Assessment Type ¹: Written Submission

Indicative Time on Task ²: 30 hours

Due: **09/10/2026**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Open

This assessment requires the submission of a short scientific report that contextualises the experimental observations and results acquired during laboratory classes.

On successful completion you will be able to:

- Describe and interpret key cellular pathways that regulate biological processes and homeostasis, and explain their relevance in disease contexts. (Capability 1: Scientist and Scholar)
- Critically evaluate contemporary issues in molecular and cellular biology and genomics, synthesising research evidence to inform diagnostic and therapeutic innovation. (Capability 1: Scientist and Scholar)
- Design, conduct, and analyse experiments to investigate cellular processes, integrating theoretical knowledge with practical skills to generate and interpret data. (Capability 2: Practitioner)
- Extract and critically analyse scientific information from publications, and communicate

findings effectively through written, oral and collaborative formats. (Capability 4: Professional)

Final examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 30 hours

Due: **Exam Period**

Weighting: **50%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

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

On successful completion you will be able to:

- Describe and interpret key cellular pathways that regulate biological processes and homeostasis, and explain their relevance in disease contexts. (Capability 1: Scientist and Scholar)
- Critically evaluate contemporary issues in molecular and cellular biology and genomics, synthesising research evidence to inform diagnostic and therapeutic innovation. (Capability 1: Scientist and Scholar)
- Design, conduct, and analyse experiments to investigate cellular processes, integrating theoretical knowledge with practical skills to generate and interpret data. (Capability 2: Practitioner)
- Extract and critically analyse scientific information from publications, and communicate findings effectively through written, oral and collaborative formats. (Capability 4: Professional)

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
- [Academic Success](#) 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.

³ An automatic short extension is available for some assessments. Apply through the [Service Connect Portal](#).

Delivery and Resources

As a student enrolled in this unit, you will engage in a range of online and face-to-face learning activities. Details can be found on the iLearn site for this unit.

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 (2022) Molecular Biology of the Cell (7th Edition). W W Norton & Company

Please note that the resources are recommended to complement your understanding of the unit content. The readings are not compulsory and will not be assessed unless covered elsewhere in the unit material.

Technology Used

Active participation in the learning activities throughout the unit will 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.

Unit Schedule

- **Week 1:** Overview, Cell Signaling Basics, Techniques in Biology
- **Week 2:** Genetics, Genomics and Genetic Therapies
- **Week 3:** Cell Cycle Dysregulation in Cancer
- **Week 4:** DNA Damage and Repair
- **Week 5:** Signaling Pathways in Health and Disease
- **Week 6:** Apoptosis and Necrosis — Cell Survival Pathways (UPS and Autophagy)
- **Week 7:** Transcription Regulation, RNA Processing and Transcriptomics in Human Disease
- **Week 8:** Protein Metabolism and Proteomics
- **Week 9:** Mitochondrial Dysfunction and Antioxidant Therapies
- **Week 10:** Transgenic Animals
- **Week 11:** Neuroprotection and Microglia — Stem Cells and Regeneration Therapies
- **Week 12:** Translating Basic Discoveries to Pharma and Clinic
- **Week 13:** Revision

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 connect.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/>

Academic Success

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

- [Ask a Study Coach](#)
- [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 Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

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

IT Help

For help with University computer systems and technology, visit <https://students.mq.edu.au/support/technology/service-desk>.

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.

Artificial Intelligence Tools

Macquarie University recognises that artificial intelligence (AI), especially generative AI, is rapidly reshaping education and the modern workplace. As AI becomes increasingly accessible, the University and your teaching staff are committed to preparing you to use these tools effectively, ethically, and with strong professional judgment. Rather than restricting technology, the

emphasis is on helping you understand when and how AI can be used to enhance productivity, support learning, and reflect real-world professional practice. Across your degree, we will support you to develop the critical thinking, adaptability, and values-based decision-making skills required to navigate evolving AI tools responsibly, including acknowledging their use appropriately. You should always appropriately acknowledge when you have used AI tools within assessment tasks, including which AI tools you have used and how you have used them.

To provide clarity, Macquarie University uses a simple, two-tiered approach to AI in assessment:

- AI Open assessments allow you to fully incorporate AI, reflecting authentic tasks where AI would normally be used in professional settings.
- Observed with AI Optional assessments involve tasks where you either demonstrate essential knowledge without technology or show how you apply AI under supervision.

Across both categories, the goal is to ensure you build foundational knowledge, exercise sound judgment, and engage with AI in ways that uphold ethical, cultural, and university values.

Inclusion and Diversity

Social inclusion at Macquarie University is about giving everyone who has the potential to benefit from higher education the opportunity to study at university, participate in campus life and flourish in their chosen field. The University has made significant moves to promote an equitable, diverse and exciting campus community for the benefit of staff and students. It is your responsibility to contribute towards the development of an inclusive culture and practice in the areas of learning and teaching, research, and service orientation and delivery. As a member of the Macquarie University community, you must not discriminate against or harass others based on their sex, gender, race, marital status, carers' responsibilities, disability, sexual orientation, age, political conviction or religious belief. All staff and students are expected to display appropriate behaviour that is conducive to a healthy learning environment for everyone.

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 clinical, practical, laboratory, work-integrated learning (e.g., PACE placements), and team-based learning activities. Some learning activities are recorded (e.g., face-to-face lectures), however you are encouraged to avoid relying upon such material as they do not recreate the whole learning experience and technical issues can and do occur. As an adult learner, we respect your decision to choose how you engage with your learning, but we would remind you that the learning opportunities we create for you have been done so to enable your success, and that by not engaging you may impact your ability to successfully complete this unit. We equally expect that you show respect for the academic staff who have worked hard to develop meaningful activities and prioritise your learning by communicating with them in advance if you are unable to attend a small group interactive session.

Another dimension of professionalism is having respect for your peers. It is the right of every

student to learn in an environment that is free of disruption and distraction. Please arrive to all learning activities on time, and if you are unavoidably detained, please join activity as quietly as possible to minimise disruption. Phones and other electronic devices that produce noise and other distractions must be turned off prior to entering class. Where your own device (e.g., laptop) is being used for class-related activities, you are asked to close down all other applications to avoid distraction to you and others. Please treat your fellow students with the utmost respect. If you are uncomfortable participating in any specific activity, please let the relevant academic know.

Unit information based on version 2026.02 of the [Handbook](#)