



# BMOL6231

## Advanced Biochemistry and Cell Biology

Session 2, In person-scheduled-weekday, North Ryde 2024

*School of Natural Sciences*

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#### **Disclaimer**

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## General Information

### Unit convenor and teaching staff

Unit Convenor

Paul Jaschke

[paul.jaschke@mq.edu.au](mailto:paul.jaschke@mq.edu.au)

Contact via email

Lecturer

Robert Willows

[robert.willows@mq.edu.au](mailto:robert.willows@mq.edu.au)

Contact via email

Credit points

10

Prerequisites

Admission to GradDipBiotech or GradCertLabAQMgt or GradDipLabAQMgt or MBiotech or MBioBus or MLabAQMgt or MRadiopharmSc or MSc or MScInnovationChemBiomolecularSc

Corequisites

Co-badged status

Unit description

Biochemistry and cell biology are central to our understanding of medicine and biotechnology. Advances in these fields are dependent on an advanced understanding of the molecular basis of diverse cellular processes. This unit links important biochemical processes to functions and properties of eukaryotic cells. We explore advanced concepts including: enzyme function, properties of membranes, signal transduction, protein trafficking and transport, and protein turnover. These are linked to whole cell behaviours such as cell division and differentiation, programmed cell death, and general responses to external stimuli. Practical work complements lecture material and provides experience with a broad range of current techniques used in research and industry. Laboratory techniques used include analysis of signalling cascades, enzyme kinetics, spectrophotometry, and fluorescence and light 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:** Demonstrate an understanding of how eukaryotic cells are studied and summarise current knowledge of internal cell organisation, membrane trafficking, intracellular compartments, biochemical pathways, and intra- and extra-cellular signalling.

**ULO2:** Summarise the major eukaryotic cell regulation control points and how disturbances in these processes are involved in human disease.

**ULO3:** Design and execute laboratory experiments to characterise, quantitate and measure a range of fundamental cell processes.

**ULO4:** Critically analyse and communicate advanced molecular, cellular, and biochemical concepts from the primary literature in both verbal and written form.

## General Assessment Information

All assignments must be submitted as soft copy before the date & time specified on iLearn. Specific instructions for how to successfully complete assessments will be provided on iLearn. Criteria and standards required for the assessment tasks will be available on iLearn. For any unapproved absences, students will receive a zero mark.

Online quizzes, in-class activities, or scheduled tests and exam must be undertaken at the time indicated in the unit guide. Should these activities be missed due to illness or misadventure, students may apply for Special Consideration.

All other assessments must be submitted by 5:00 pm on their due date. Should these assessments be missed due to illness or misadventure, students should apply for Special Consideration.

### Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7<sup>th</sup> day (including weekends). After the 7<sup>th</sup> day, a grade of '0' will be awarded even if the assessment is submitted.

The submission time for all uploaded assessments is **11:55 pm**. A 1-hour grace period will be provided to students who experience a technical concern. For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for [Special Consideration](#).

### Assessments where Late Submissions will be accepted

In this unit, late submissions will accepted as follows:

**Lab Report Assessment** – YES, Standard Late Penalty applies

**All Other Assessments** (Lecture Contribution, Practice-Based Task, Early Test, and Final Examination) - NO, unless Special Consideration is Granted

### Requirements to Pass this Unit

To pass this unit you must:

- Achieve a total mark equal to or greater than 50%, and
- Participate in, and undertake all hurdle activities for a minimum of 6/9 completed.

### Hurdle Assessments

**Practice-based task (0%)** Development of knowledge and skills requires continual practice at authentic problems in a laboratory-based setting. This unit has weekly laboratory classes and you must demonstrate your progress in developing and communicating knowledge and skills in a minimum of 6 of the 9 classes. This is a hurdle assessment meaning that failure to meet this requirement may result in a fail grade for the unit. Students are permitted up to three absences: additional absences will require approval of Special Consideration (see below).

## Special Consideration

The Special Consideration Policy aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment.

**Written Assessments:** If you experience circumstances or events that affect your ability to complete the written assessments in this unit on time, please inform the convenor and submit a Special Consideration request through [ask.mq.edu.au](https://ask.mq.edu.au).

**Weekly practice-based tasks:** To pass the unit you need to demonstrate ongoing development of skills and application of knowledge in 6 out of 9 of the weekly practical classes. If you miss a weekly practical class due to a serious, unavoidable and significant disruption, contact your convenor ASAP as you may be able to attend another class that week. If it is not possible to attend another class, you should still contact your convenor for access to class material to review in your own time.

Note that a Special Consideration should only be applied for if you miss more than three of the weekly practical classes.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Early Test</a>	10%	No	Week 4
<a href="#">Lab Report</a>	50%	No	Weeks 6-11
<a href="#">Practice-Based Task</a>	0%	Yes	Weeks 1-13
<a href="#">Lecture Contribution</a>	5%	No	Weeks 1-13
<a href="#">Final Examination</a>	35%	No	Exam Period

## Early Test

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 12 hours

Due: **Week 4**

Weighting: **10%**

An test on material covered in the first half of the unit

On successful completion you will be able to:

- Demonstrate an understanding of how eukaryotic cells are studied and summarise current knowledge of internal cell organisation, membrane trafficking, intracellular compartments, biochemical pathways, and intra- and extra-cellular signalling.
- Summarise the major eukaryotic cell regulation control points and how disturbances in these processes are involved in human disease.

## Lab Report

Assessment Type <sup>1</sup>: Lab report

Indicative Time on Task <sup>2</sup>: 50 hours

Due: **Weeks 6-11**

Weighting: **50%**

Four laboratory reports will be submitted as part of this assessment. Three of these will be partial laboratory reports that are formative types of assessment to gain experience in writing particular components of the analysis and reporting of biochemical and/or cell biological data. The fourth report will be a full laboratory report combining most aspects of a scientific report in the biochemical and cell biological fields.

On successful completion you will be able to:

- Demonstrate an understanding of how eukaryotic cells are studied and summarise current knowledge of internal cell organisation, membrane trafficking, intracellular compartments, biochemical pathways, and intra- and extra-cellular signalling.
- Summarise the major eukaryotic cell regulation control points and how disturbances in these processes are involved in human disease.
- Design and execute laboratory experiments to characterise, quantitate and measure a

range of fundamental cell processes.

- Critically analyse and communicate advanced molecular, cellular, and biochemical concepts from the primary literature in both verbal and written form.

## Practice-Based Task

Assessment Type <sup>1</sup>: Practice-based task

Indicative Time on Task <sup>2</sup>: 0 hours

Due: **Weeks 1-13**

Weighting: **0%**

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

Demonstration of practical laboratory skills and knowledge of protocols, and the submission of practical tasks.

On successful completion you will be able to:

- Design and execute laboratory experiments to characterise, quantitate and measure a range of fundamental cell processes.

## Lecture Contribution

Assessment Type <sup>1</sup>: Practice-based task

Indicative Time on Task <sup>2</sup>: 5 hours

Due: **Weeks 1-13**

Weighting: **5%**

Small practice-based tasks across the semester.

On successful completion you will be able to:

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- Summarise the major eukaryotic cell regulation control points and how disturbances in these processes are involved in human disease.

## Final Examination

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 30 hours

Due: **Exam Period**

Weighting: **35%**

A final examination on material covered during the unit

On successful completion you will be able to:

- Demonstrate an understanding of how eukaryotic cells are studied and summarise current knowledge of internal cell organisation, membrane trafficking, intracellular compartments, biochemical pathways, and intra- and extra-cellular signalling.
- Summarise the major eukaryotic cell regulation control points and how disturbances in these processes are involved in human disease.
- Critically analyse and communicate advanced molecular, cellular, and biochemical concepts from the primary literature in both verbal and written form.

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<sup>1</sup> 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.

<sup>2</sup> 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**

### **Week 1 Classes**

**Lectures (attend in-person or via Echo360 Active Learning Platform):**

Tues: 10 am - 11 am

Thur: 4 pm - 5 pm

#### **Practical\_1 (attend in-person)**

Practical attendance is compulsory. Only attend the one class per week you are registered in.

Tuesday: 2 pm - 5 pm

Wednesday: 10 am - 1 pm and 2 pm - 5 pm

- All practicals held in **14SCO 349/350**

- Close-toed shoes, lab coats, and safety glasses must be worn in every practical unless instructed otherwise.
- Lab coats MUST be provided by students. If you do not have a lab coat you will be turned away from practical.
- We highly encourage students to bring their own safety glasses.

## Methods of Communication

We will communicate with you via [your university email](#) and through [announcements on iLearn](#). Queries to convenors can either be placed on the iLearn discussion board or sent to the unit convenor via the contact email on iLearn.

## COVID Information

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: <https://www.mq.edu.au/about/coronavirus-faqs>. Remember to check this page regularly in case the information and requirements change during semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.s.mq.edu.au\)](https://policies.s.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](http://connect.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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 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 [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.

## Changes from Previous Offering

We value student feedback to be able to continually improve the way we offer our units. As such we encourage students to provide constructive feedback via student surveys, to the teaching staff directly, or via the FSE Student Experience & Feedback link in the iLearn page.

No change to the delivery of the unit is planned, however we will continue to strive to improve the level of support and the level of student engagement.

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Unit information based on version 2024.01R of the [Handbook](#)