



MOLS8611

Molecular and Medical Biotechnology

Session 2, Weekday attendance, North Ryde 2020

Department of Molecular Sciences

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Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

General Information

Unit convenor and teaching staff

Morten Andersen

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Associate convenor

Angela Sun

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Associate convenor

Liisa Kautto

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Credit points

10

Prerequisites

(Admission to MBioBus or GradDipBiotech or MBiotech or MRadiopharmSc or MSc or MScInnovationChemBiomolecularSc) and (BMOL6401 or CBMS622) or (BMOL6431 or CBMS335)

Corequisites

Co-badged status

MOLS7611

Unit description

This unit is composed of lectures, a significant hands-on laboratory component, student debate, tutorials, assignments and reports. We will explore areas of contemporary molecular and medical biotechnology by building on students' existing knowledge and showing how science is translated to applications in health, industry and the environment. Lecture topics range from the production of recombinant biomolecules in various cell factories and their industrial and medical applications to nanobiotechnology and stem cells. Instrumentation and technology supporting biotechnology will be introduced and discussed. Visiting lecturers from various academic disciplines will lead discussion on their areas of expertise. The unit also has a significant hands-on laboratory component with tutorials and assignment tasks.

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 key concepts of biotechnology, its interdisciplinary nature and impact on modern society.

ULO2: Demonstrate good practical laboratory skills involving the use of contemporary experimental techniques in biotechnology including microbial culture, and production and characterisation of recombinant glycoproteins of therapeutic value.

ULO3: Relate information published in the scientific literature to practical research questions in biotechnology

ULO4: Explain and interpret results from the laboratory experiments carried out during the practicals reflecting published literature and relevant technical and theoretical concepts.

ULO5: Critique and communicate a complex biotechnology topic in writing and orally and practice the ability to form opinions on the safety and ethics issues related to gene editing in our society.

ULO6: Engage in curiosity-driven learning activities and critically evaluate the work of others.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Continuing assessment</u>	5%	No	TBA
<u>Report 2</u>	8%	No	TBA
<u>Report 3</u>	12%	No	TBA
<u>The Great Debate</u>	5%	No	TBA
<u>Hot topic essay</u>	10%	No	TBA
<u>Final Examination</u>	40%	No	TBA
<u>Report 1</u>	15%	No	TBA
<u>Primer crafting task</u>	5%	No	TBA

Continuing assessment

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 12 hours

Due: **TBA**

Weighting: **5%**

Continuing assessment involves providing a brief answer to a weekly question appearing on iLearn each week.

On successful completion you will be able to:

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- Relate information published in the scientific literature to practical research questions in biotechnology
- Explain and interpret results from the laboratory experiments carried out during the practicals reflecting published literature and relevant technical and theoretical concepts.
- Critique and communicate a complex biotechnology topic in writing and orally and practice the ability to form opinions on the safety and ethics issues related to gene editing in our society.
- Engage in curiosity-driven learning activities and critically evaluate the work of others.

Report 2

Assessment Type ¹: Lab report

Indicative Time on Task ²: 8 hours

Due: **TBA**

Weighting: **8%**

Report 2 is based on the experiments conducted in Practical 2. Students are expected to take into account the feedback from report 1 to improve their performance in report 2 and produce an executive summary linking together Practicals 1 and 2, as part of the report.

On successful completion you will be able to:

- Demonstrate an understanding of key concepts of biotechnology, its interdisciplinary nature and impact on modern society.
- Demonstrate good practical laboratory skills involving the use of contemporary experimental techniques in biotechnology including microbial culture, and production and characterisation of recombinant glycoproteins of therapeutic value.

- Relate information published in the scientific literature to practical research questions in biotechnology
- Explain and interpret results from the laboratory experiments carried out during the practicals reflecting published literature and relevant technical and theoretical concepts.
- Critique and communicate a complex biotechnology topic in writing and orally and practice the ability to form opinions on the safety and ethics issues related to gene editing in our society.
- Engage in curiosity-driven learning activities and critically evaluate the work of others.

Report 3

Assessment Type ¹: Lab report

Indicative Time on Task ²: 10 hours

Due: **TBA**

Weighting: **12%**

Written report on Practical 3.

On successful completion you will be able to:

- Demonstrate an understanding of key concepts of biotechnology, its interdisciplinary nature and impact on modern society.
- Demonstrate good practical laboratory skills involving the use of contemporary experimental techniques in biotechnology including microbial culture, and production and characterisation of recombinant glycoproteins of therapeutic value.
- Relate information published in the scientific literature to practical research questions in biotechnology
- Explain and interpret results from the laboratory experiments carried out during the practicals reflecting published literature and relevant technical and theoretical concepts.

The Great Debate

Assessment Type ¹: Debate

Indicative Time on Task ²: 5 hours

Due: **TBA**

Weighting: **5%**

The students will be divided into groups who will be given a topic in the area of biotechnology which they either have to defend or oppose.

On successful completion you will be able to:

- Demonstrate an understanding of key concepts of biotechnology, its interdisciplinary nature and impact on modern society.
- Critique and communicate a complex biotechnology topic in writing and orally and practice the ability to form opinions on the safety and ethics issues related to gene editing in our society.

Hot topic essay

Assessment Type ¹: Essay

Indicative Time on Task ²: 10 hours

Due: **TBA**

Weighting: **10%**

This essay will be written in the “Times magazine style”, i.e. to a broader audience. Your task is to engage the reader and present your point of view.

On successful completion you will be able to:

- Demonstrate an understanding of key concepts of biotechnology, its interdisciplinary nature and impact on modern society.
- Explain and interpret results from the laboratory experiments carried out during the practicals reflecting published literature and relevant technical and theoretical concepts.
- Critique and communicate a complex biotechnology topic in writing and orally and practice the ability to form opinions on the safety and ethics issues related to gene editing in our society.
- Engage in curiosity-driven learning activities and critically evaluate the work of others.

Final Examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 14 hours

Due: **TBA**

Weighting: **40%**

The final examination will be 3 hours plus 10 min reading time. The examination will cover all sections of the unit including tutorials and practicals and consists of short answers, problem solving tasks and essay questions.

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- Demonstrate good practical laboratory skills involving the use of contemporary experimental techniques in biotechnology including microbial culture, and production and characterisation of recombinant glycoproteins of therapeutic value.
- Relate information published in the scientific literature to practical research questions in biotechnology
- Explain and interpret results from the laboratory experiments carried out during the practicals reflecting published literature and relevant technical and theoretical concepts.
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Report 1

Assessment Type ¹: Lab report

Indicative Time on Task ²: 15 hours

Due: **TBA**

Weighting: **15%**

The written report on Practical 1 will introduce students to report writing and provide early feedback on the skills and style in report writing and extracting relevant information from various paper and electronic sources.

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- Demonstrate good practical laboratory skills involving the use of contemporary experimental techniques in biotechnology including microbial culture, and production and characterisation of recombinant glycoproteins of therapeutic value.
- Relate information published in the scientific literature to practical research questions in biotechnology
- Explain and interpret results from the laboratory experiments carried out during the practicals reflecting published literature and relevant technical and theoretical concepts.

- Critique and communicate a complex biotechnology topic in writing and orally and practice the ability to form opinions on the safety and ethics issues related to gene editing in our society.
- Engage in curiosity-driven learning activities and critically evaluate the work of others.

Primer crafting task

Assessment Type ¹: Design Task

Indicative Time on Task ²: 6 hours

Due: **TBA**

Weighting: **5%**

You will learn how to turn a peptide sequence to a DNA sequence and design oligonucleotide primers for various purposes in the laboratory such as “catching” a gene and DNA sequencing.

On successful completion you will be able to:

- Demonstrate good practical laboratory skills involving the use of contemporary experimental techniques in biotechnology including microbial culture, and production and characterisation of recombinant glycoproteins of therapeutic value.
- Relate information published in the scientific literature to practical research questions in biotechnology
- Explain and interpret results from the laboratory experiments carried out during the practicals reflecting published literature and relevant technical and theoretical concepts.
- Critique and communicate a complex biotechnology topic in writing and orally and practice the ability to form opinions on the safety and ethics issues related to gene editing in our society.
- Engage in curiosity-driven learning activities and critically evaluate the work of others.

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

Lectures: All via Zoom (see unit iLearn site for details)

Practicals and tutorials: All on campus (see unit iLearn site for details)

All communication and resources are delivered via the unit iLearn site

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.*)

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 or if you are a Global MBA student contact 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) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [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

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

If you are a Global MBA student contact 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/.

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.