MEDI3200

Translational Biology and Genomics

Session 2, Special circumstance, North Ryde 2020

Medicine, Health and Human Sciences Faculty level units

Contents

Notice

As part of Phase 3 of our return to campus plan, most units will now run tutorials, seminars and ot her small group learning activities on campus for the second half-year, while keeping an online ver sion available for those students unable to return or those who choose to continue their studies onli ne.

To check the availability of face-to-face and onlin e activities for your unit, please go to timetable vi ewer. To check detailed information on unit asses sments visit your unit's iLearn space or consult yo ur unit convenor.

General Information

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Credit points
10

Prerequisites
140cp at 1000 level or above including (CBMS107 or CHEM1001 or CBMS104 or BMOL1001) and ((MEDI219 or MEDI2200) or ((BIOL206 or BIOL2110) and (CBMS202 or BMOL2401))

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 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 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, 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 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. 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 until 10 days. After that point, no late submissions will be accepted. 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
Final examination	50%	No	Exam period
Laboratory Report and Assignments	35%	No	Wk 7 (Bioinformatics),Wk 9 (Lab report), Wk 13 (Microscopy)

Name	Weighting	Hurdle	Due
Ongoing Weekly Quizzes	15%	No	Ongoing

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.

Laboratory Report and Assignments

Assessment Type [1]: Lab report
Indicative Time on Task [2]: 30 hours
Due: **Wk 7 (Bioinformatics),Wk 9 (Lab report), Wk 13 (Microscopy)**
Weighting: **35%**

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.

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.

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[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

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, Cell Signaling Basics, Techniques in biology	Albert Lee/ iLearn	Tutorial 1		Online Quiz
2	Genetics, Genomics and Genetic Therapies	Jenn Fifita		Western Blot and Online	Online Quiz
3	Cell Cycle dysregulation in cancer	Lucinda McRobb	Tutorial 2		Online Quiz
4	DNA damage and repair	Lucinda McRobb		Western Blot and Online	Online Quiz
5	Signaling pathways in health and disease	Esther Lim	Tutorial 3		Online Quiz
6	Apoptosis and Necrosis Cell survival pathways (UPS and autophagy)	Albert Lee/ Shu Yang		Online	Online Quiz
7	Transcription regulation, RNA processing and Transcriptomics in human disease	Albert Lee	Tutorial 4		Online Quiz & Bioinformatics Assignment
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8	Protein Metabolism and Proteomics	Albert Lee			
9	Mitochondrial dysfunction and antioxidant therapies	Albert Lee	Tutorial 5	Online	Group Lab Report
10	Transgenic animals	Marco Morsch		Microscopy	
11	Neuroprotection and Microglia Stem Cells and Regeneration Therapies	Roger Chung	Tutorial 6	Online	
12	Translating basic discoveries to pharma and clinic	Albert Lee			
13	Revision	Albert Lee	Revision		Microscopy Report

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). 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). 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).

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.