



BMSC12012 Applied Molecular and Cellular Pathology

Term 2 - 2019

Profile information current as at 04/05/2024 05:44 pm

All details in this unit profile for BMSC12012 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

Molecular and cellular pathology involves the study of disease processes at the molecular level and allows diagnosis of disease through the detection of genetic mutations, dysregulated gene expression and non functional or cytotoxic proteins. In this unit, you will understand the role of cellular genetic material and associated genetic rearrangements and mutations. You will explore the application of molecular techniques, such polymerase chain reaction and next generation sequencing, and their revolutionary impact on diagnostic testing.

Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisite: BIOL12106 Molecular Biology

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 2 - 2019

- Online
- Rockhampton

Attendance Requirements

All on-campus students are expected to attend scheduled classes - in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Group Work**

Weighting: 40%

2. **Examination**

Weighting: 60%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Student feedback

Feedback

Some Lecture Material too advanced

Recommendation

Review the scaffolding process supporting lecture material in particular a stepwise approach to conveying new topics

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Describe the molecular basis of disease, in terms of gene mutations or rearrangements, and their detection
2. Describe the relationship of disease to epigenetic modification of the genome
3. Explain the process of identifying genetic changes and their significance
4. Explain the use of molecular pathology in disease diagnosis and / or prevention and treatment, including the development of personalised medicines.

The learning outcomes achieved are linked to the objectives of the accrediting body, Australian Institute of Medical Scientists (AIMS).

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Group Work - 40%	•	•	•	•
2 - Examination - 60%	•	•	•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Communication	•	•	•	•
2 - Problem Solving	•	•	•	•
3 - Critical Thinking	•	•	•	•
4 - Information Literacy	•	•	•	•

Graduate Attributes	Learning Outcomes			
	1	2	3	4
5 - Team Work				•
6 - Information Technology Competence				
7 - Cross Cultural Competence				
8 - Ethical practice				•
9 - Social Innovation				
10 - Aboriginal and Torres Strait Islander Cultures				

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Group Work - 40%	•	•	•	•	•			•		
2 - Examination - 60%	•	•	•	•						

Textbooks and Resources

Textbooks

BMSC12012

Prescribed

Molecular Pathology: The Molecular Basis of Human Disease

2nd edition (2017)

Authors: Coleman, W & Tsongalis, G

Academic Press

San Diego, CA, USA

ISBN: 9780128027615

Binding: Hardcover

Additional Textbook Information

[View textbooks at the CQUniversity Bookshop](#)

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)
For further information, see the Assessment Tasks.

Teaching Contacts

Padraig Strappe Unit Coordinator
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Schedule

Week 1 - 15 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to basic concepts in Molecular pathology	Chapter 1 and 2 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom Tutorial (Recorded) Welcome to the Unit and an overview of subject content, learning materials and assessments

Week 2 - 22 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
'Omics' Technologies supporting molecular diagnosis	Chapter 7 and 9 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 1

Week 3 - 29 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Epigenetics and Human disease	Chapter 8 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 2

Week 4 - 05 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Molecular basis of Cardiovascular disease	Chapter 14 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 3

Week 5 - 12 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Molecular basis of blood disorders	Chapter 15 and 16 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 4

Vacation Week - 19 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 26 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Molecular basis of colorectal, prostate and breast cancer	Chapter 19, 25 and 26 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 5
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Week 7 - 02 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Molecular basis of Liver and Kidney Disease	Chapter 20 and 24 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 6

Week 8 - 09 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Molecular basis of skin disease	Chapter 27 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 7

Week 9 - 16 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Molecular basis of diseases of the nervous system	Chapter 29 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 8 Portfolio Assignment Due: Week 9 Monday (16 Sept 2019) 11:45 pm AEST

Week 10 - 23 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Molecular Basis of Musculoskeletal disease	Chapter 28 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 9

Week 11 - 30 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Molecular basis of diseases of the exocrine and endocrine system	Chapter 21 and 22 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 10

Week 12 - 07 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
Revision	All chapters highlighted for weeks 1 to 11 (Molecular Pathology, Molecular Basis of Human disease, Coleman and Tsongalis, 2nd Ed)	Rockhampton Lecture and Zoom tutorial on content from week 11

Review/Exam Week - 14 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
		Zoom tutorial Revision

Exam Week - 21 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

A weekly on line zoom tutorial will be provided which will start in week 2 and the day time will be confirmed, all tutorials will be recorded and available on Moodle.

This subject does not have a Residential School.

Assessment Tasks

1 Portfolio Assignment

Assessment Type

Group Work

Task Description

Increased understanding of disease pathogenesis at the cellular and molecular level leads to the discovery of novel biomarkers to enhance diagnosis and new targets for therapeutics. In this assignment you will be required to produce a comprehensive review of molecular advances associated with a particular disease in terms of (A) Pathogenesis, (B) Diagnosis and (C) Treatment.

This assessment is group based and groups of three students (3) will be assigned by the unit co-coordinator in week 1 and details of group members will be posted on the Moodle site. Each group will be assigned a specific disease / pathological disorder.

For each of these 3 sections (Pathogenesis, Diagnosis and Treatment) the group will decide which section each student will focus on and each student will be required to

- Write between one 2000 to 2500 word essay supported by references (up to ten references) outlining advances in either understanding disease pathology, laboratory based diagnosis or therapeutic strategies
- Review and critique in detail one scientific paper which has contributed to advanced knowledge associated with each section (Pathogenesis, Diagnosis and Treatment).

The final portfolio will be a combination of the three essays and three paper critiques from the three students together with an Introduction, summary and conclusion section written by the group.

Your critical appraisal of a major scientific paper should include a

- Summary of the outcomes of the described research,
- How these findings were a significant advance in either pathogenesis/diagnosis/treatment,
- What methodology was used and what further developments have occurred based on the original paper.

The paper critique is expected to be concise , between 750 and 1000 words.

Examples of specific diseases available for this assignment will include but are not limited to

- Diabetic Nephropathy
- Liver Cirrhosis
- Pulmonary Arterial Hypertension
- Multiple Sclerosis, Prostate Cancer, Acute Myeloblastic lymphoma
- Chronic wound healing
- Chronic heart failure
- Paget's disease of bone

An individual 'Wiki' will be available on the Moodle site for each group to facilitate group collaboration for the assessment task, production of a draft form and final submission.

Group based assignments can provide enhanced learning through collaborative generation of ideas, delegation of tasks and presentation

The overall 40% available for this assessment is broken down as follows

(1) The overall quality of the groups portfolio (30%).

(2) Assessment of each individuals contribution to the portfolio (10%).

60 marks is available for each Review section and broken down as follows

- 20 marks for the scientific paper critique
- 40 marks for the review

20 marks is available for the overall contribution of each individual to group work as assessed by the peer questionnaire (20 marks)

For part 1 a detailed marking rubric will be available on the Moodle site
For part 2, assessment of individual contribution to the team will be performed by evidence of activity on the wiki and use of a peer review questionnaire, where each team can rate other group members by their team participation. This then feeds back to give a score for team participation to each student.

Assessment Due Date

Week 9 Monday (16 Sept 2019) 11:45 pm AEST

Return Date to Students

Review/Exam Week Monday (14 Oct 2019)

Weighting

40%

Minimum mark or grade

Minimum passing grade of 50% equivalent to 100 marks out of 200

Assessment Criteria

The portfolio assessment is an opportunity to further research the contribution that molecular and cell biology has made to understanding a specific disease together with advances in diagnostic technology and treatment.

A detailed marking rubric will be available on the unit Moodle site, a brief overview of assessment criteria are as follows

A total of 200 marks are available for this assessment

3 x 60 marks for each Review Section

20 marks for each individual contribution to group work

The overall review is composed of 3 sections relating to Pathogenesis, Diagnosis and Treatment, and each section will also contain an accompanying critique of a scientific paper (3 x 60 marks)

60 marks is available for each section and broken down as follows

- 20 marks for the scientific paper critique composed of 1: clarity of aims and objectives (5 marks), 2: Summary of Methodology (5 marks), 3: Significance of paper (10 marks)
- 40 marks for the review composed of Introduction (10 marks), description of scientific advances (15 marks), Layout and organisation (10 marks), appropriate referencing (5 marks) the

20 marks for the overall contribution of each individual to group work as assessed by the peer questionnaire

Weighting

40%

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online Group

Submission Instructions

Word document submitted on line through moodle site

Learning Outcomes Assessed

- Describe the molecular basis of disease, in terms of gene mutations or rearrangements, and their detection
- Describe the relationship of disease to epigenetic modification of the genome
- Explain the process of identifying genetic changes and their significance
- Explain the use of molecular pathology in disease diagnosis and / or prevention and treatment, including the development of personalised medicines.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Ethical practice

Examination

Outline

Complete an invigilated examination.

Date

During the examination period at a CQUniversity examination centre.

Weighting

60%

Length

120 minutes

Minimum mark or grade

A minimum passing grade of 50%

Exam Conditions

Closed Book.

Materials

Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

Calculator - non-programmable, no text retrieval, silent only

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?



Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem