



ECHO11004 *Biochemistry for Cardiac Pharmacology*

Term 3 - 2018

Profile information current as at 17/05/2024 11:50 am

All details in this unit profile for ECHO11004 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

This unit will enable you to develop knowledge and understanding of biomolecules, cell function and cellular biochemistry. You will develop a basic understanding of how biomolecules are synthesised, catabolised and interconverted through key biochemical pathways to meet the needs of the cell and organism. Cellular biochemistry will explore aspects of cell-cell communication to provide the necessary knowledge to study disease and drug treatment at the cellular level. This unit will prepare you for advanced level study of cardiovascular pharmacology.

Details

Career Level: *Undergraduate*

Unit Level: *Level 1*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Pre-requisite: ECHO11003 Fundamentals of Cardiac Science AND Co-requisite BMSC11002 Human Body Systems 2

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 3 - 2018

- Brisbane
- Distance
- Perth
- Sydney

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. **Online Quiz(zes)**

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](#).

Unit Learning Outcomes

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

1. Describe the structure, function and biological roles of the major types of biomolecules and macromolecules
2. Describe the relationship between structure and function of the components of biological membranes, especially in terms of selective permeability
3. Outline the basic processes involved in metabolic and catabolic pathways relevant to the cardiovascular system
4. Describe basic cell signalling, communication and metabolism.

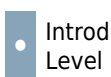
Linked to National and International Standards

1. ASAR Accreditation Standards for Cardiac Sonography - critical practice Unit 8 - Cardiac, Foundation units of competence - 1- 5.
2. European Association of Cardiovascular Imaging Core Syllabus
3. American Registry for Cardiac Sonography Core Syllabus

Alignment of Learning Outcomes, Assessment and Graduate Attributes



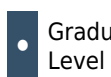
N/A
Level



Introductory
Level



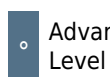
Intermediate
Level



Graduate
Level



Professional
Level



Advanced
Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Online Quiz(zes) - 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	•	•	•	•
5 - Team Work				
6 - Information Technology Competence				
7 - Cross Cultural Competence				
8 - Ethical practice				
9 - Social Innovation				

Graduate Attributes				Learning Outcomes			
				1	2	3	4
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 - Online Quiz(zes) - 40%	<div></div>	<div></div>	<div></div>	<div></div>						
2 - Examination - 60%	<div></div>	<div></div>	<div></div>	<div></div>						

Textbooks and Resources

Textbooks

ECH011004

Prescribed

Medical Biochemistry

Edition: 5th (2018)

Authors: John W Baynes and Marek H. Dominiczak

Elsevier

China

ISBN: 9780702072994

Binding: Paperback

[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: [Vancouver](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Jordon Irwin Unit Coordinator

j.irwin@cqu.edu.au

Schedule

Week 1 - 05 Nov 2018

Module/Topic	Chapter	Events and Submissions/Topic
Introduction and Macromolecules I – Carbohydrates Major cardiac case study focus for week 1: Fabry's disease is characterised by a build-up of glycosphingolipids.	Chapter 3 (pp. 25-27) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)	Tutorial on content from Week 1

Week 2 - 12 Nov 2018

Module/Topic	Chapter	Events and Submissions/Topic
Macromolecules II – Amino acids, Proteins and Enzymes Major cardiac case study focus for week 2: Fabry's disease is the result of a dysfunctional enzyme.	Chapter 2 (pp. 7-15) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)	Tutorial on content from Week 2

Week 3 - 19 Nov 2018

Module/Topic	Chapter	Events and Submissions/Topic
Macromolecules III – Nucleic acids Major cardiac case study focus for week 3: Fabry's disease is a genetic disorder.	Chapter 20 (pp. 257-258); Chapter 21 (pp. 275-280) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)	Tutorial on content from Week 3

Week 4 - 26 Nov 2018

Module/Topic	Chapter	Events and Submissions/Topic
Macromolecules IV – Lipids Major cardiac case study focus for week 4: The cardiac complications of Fabry's disease result from the deposition of glycosphingolipids.	Chapter 3 (pp. 28-31) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)	Tutorial on content from Week 4 Online Quiz 1 opens 11:55 am (AEST) Friday the 30th November 2018

Vacation Week - 03 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic
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Week 5 - 10 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic
Cell Transport I – Cell membranes, selective permeability and cell transport systems Major cardiac case study focus for week 5: Changes in cell transport caused by Fabry's Disease can produce electrophysiological abnormalities in the heart.	Chapter 4 (pp. 35-37) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)	Tutorial on content from Week 5 Online Quiz 1 closes 5:00 pm (AEST) Friday the 14th December 2018

Week 6 - 17 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic
Cell Transport II – Cell transport systems (cont.) Major cardiac case study for week 6: Changes in cell membrane composition during Fabry's disease alters cell membrane transport systems.	Chapter 4 (pp. 38-45) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)	Tutorial on content from Week 6 Online Quiz 2 opens 11:55 am (AEST) Friday the 21st December 2018

Week 7 - 31 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic
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Metabolism I – Glycolysis, Beta-oxidation, Amino Acid metabolism and the Creatine kinase reaction
Major cardiac focus for Week 7: The heart uses various macromolecules/biomolecules as sources of energy.

Chapter 7 (pp. 558-559); Chapter 9 (pp. 111-116); Chapter 11 (p. 139); Chapter 15 (pp. 189-191, pp. 195-197) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)

Tutorial on content from Week 7
Online Quiz 2 closes 5:00 pm (AEST)
Friday the 4th January 2019

Week 8 - 07 Jan 2019

Module/Topic

Metabolism II – The Krebs cycle, Electron transport chain, Oxidative phosphorylation and Alternative energy sources
Major cardiac focus for Week 8: The heart uses various macromolecules/biomolecules as sources of energy (cont.).

Chapter

Chapter 8 (pp. 96-99, 102-103); Chapter 10 (125-126, 129-134); Chapter 11 (p. 141-142) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)

Events and Submissions/Topic

Tutorial on content from Week 8

Week 9 - 14 Jan 2019

Module/Topic

Metabolism III – Metabolic profiles and metabolic regulation
Major cardiac focus for Week 9: Fabry's disease can cause cardiac hypertrophy and/or heart failure which is linked to an altered metabolic profile.

Chapter

Chapter 8 (pp. 108-109); Chapter 9 (pp. 117-118); Chapter 10 (pp. 134-135); Chapter 11 (pp. 143-145); Chapter 12 (pp. 160-161) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)

Events and Submissions/Topic

Tutorial on content from Week 9
Online Quiz 3 opens 11:55 am (AEST)
Friday the 18th January 2019

Week 10 - 21 Jan 2019

Module/Topic

Cell communication I – Intercellular and intracellular signalling mechanisms
Major cardiac case study focus for week 10: Complex intracellular transduction pathways are involved in cardiac hypertrophy and heart failure in Fabry's disease.

Chapter

Chapter 25 (pp. 344-352) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)

Events and Submissions/Topic

Tutorial on content from Week 10
Online Quiz 3 closes 5:00 pm (AEST)
Friday the 25th January 2019

Week 11 - 28 Jan 2019

Module/Topic

Cell communication II – Receptors and other cellular targets in cardiovascular pharmacology
Major case study focus for week 11: Cardiovascular pharmaceuticals can be used to manage the cardiac complications of Fabry's disease.

Chapter

Chapter 25 (pp. 339-344) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition)

Events and Submissions/Topic

Tutorial on content from Week 11
Online Quiz 4 opens 11:55 am (AEST)
Friday the 1st February 2019

Week 12 - 04 Feb 2019

Module/Topic

Revision

Chapter

Events and Submissions/Topic

Revision tutorial on unit content
Online Quiz 4 closes 5:00 pm (AEST)
Friday the 8th February 2019

Online Quizzes Due: Week 12 Friday (8 Feb 2019) 5:00 pm AEST

Exam Week - 11 Feb 2019

Module/Topic

Chapter

Events and Submissions/Topic

Term Specific Information

Your coordinator for ECHO11004 Biochemistry for Cardiac Pharmacology is Miss Jordon Irwin. I am contactable via email (j.irwin@cqu.edu.au) as well as phone (07 49232550); however, the most efficient and preferred method of contact is via the Q&A forum located on the unit Moodle site (unless the query is of a personal nature then please email me directly). Using the Q&A forum will assure you of a response within 24 hours (unless otherwise notified).

The topics covered in this unit are common to most tertiary biochemistry units. However, unlike other biochemistry subjects, this unit has been developed to be as cardiac-orientated as possible. The weekly topics being covered will be placed in a "cardiac-specific" focus using a major weekly case study (on Fabry's disease) and other cardiac-focused examples. More information on this is provided in the "Unit orientation" and "Pre-term Lecture" videos located on the unit Moodle site.

Tutorials for this unit will be delivered online using ZOOM. The link for each weekly tutorial will be provided on the unit Moodle site. Prior to attending/viewing the each tutorial, it is expected that you would have watched the relevant lecture/s, read the study accompanying notes/textbook readings and attempted the study questions. The weekly study questions are available from the Moodle site. I would strongly encourage you to attend the tutorials "live" where possible as a large proportion of time in these sessions will be dedicated to addressing student-raised questions.

As per Australian educational standards, you are expected to commit a total of 150 hours (i.e. 12.5 hours per week) of engagement to your study of this unit. A suggestion for how you should allocate your study commitment per week is as follows:

- 2 - 3 hours watching recorded lectures
- 2 - 3 hours reading the study notes and relevant textbook chapter/s
- 1 - 2 hours completing the weekly study questions and weekly revision quizzes on the unit's Moodle site.
- 1 - 2 hours per week attending the weekly tutorial
- 3 - 4 hours per week studying for your quizzes/exams

Assessment Tasks

1 Online Quizzes

Assessment Type

Online Quiz(zes)

Task Description

During this unit you will develop your knowledge on biomolecules and cell function, including macromolecules, cell transport of materials, catabolic/metabolic pathways as well as cell signalling /communication. Your knowledge of these concepts will be assessed through the completion of four (4) online quizzes. In turn, your completion of this assessment will provide you with the opportunity to assess your own understanding of the core unit concepts. Each quiz will be comprised of 20 multiple choice questions and each correct answer will be worth 1 mark (no marks will be deducted for incorrect answers). You will have 30 minutes to attempt each quiz and are permitted only one attempt per quiz so please ensure that you have reviewed the relevant unit concept/s thoroughly prior to attempting each quiz. Each quiz will be automatically submitted at the completion of the 30 minute period.

Your score from each individual quiz will contribute 10% to your final grade. Thus, your combined score from the quizzes will contribute to 40% of your final grade (4 quizzes x 10% = 40%).

The specific dates that each quiz will open and close are outlined in the below. Please note that the quizzes must be completed before the due date listed. In the absence of an approved extension, there will be no opportunity to complete the task after this date, and there will be no opportunity to apply a late penalty of five percent per day.

1. Quiz 1 will open at 11:55 am (AEST) on Friday the 30th November 2018 (Week 4) and will be open until 5:00 pm (AEST) Friday the 14th December 2018 (Week 5). This quiz will assess the topics covered during Weeks 1 to 4.
2. Quiz 2 will open at 11:55 am (AEST) on Friday the 21st December 2018 (Week 6) and will be open until 5:00 pm (AEST) Friday the 4th January 2019 (Week 7). This quiz will assess the topics covered during Weeks 5 to 6.
3. Quiz 3 will open at 11:55 am (AEST) on Friday the 18th January 2019 (Week 9) and will be open until 5:00 pm (AEST) Friday the 25th January 2019 (Week 10). This quiz will assess the topics covered during Weeks 7 to 9.
4. Quiz 4 will open at 11:55 am (AEST) on Friday the 1st February 2019 (Week 11) and will be open until 5:00 pm (AEST) on Friday the 8th February 2019 (Week 12). This quiz will assess the topics covered during Weeks 10 to 11.

Number of Quizzes

4

Frequency of Quizzes

Other

Assessment Due Date

Week 12 Friday (8 Feb 2019) 5:00 pm AEST

Please see the timeline outlined above for specific information about quiz opening times and due dates

Return Date to Students

Week 12 Friday (8 Feb 2019)

Students will receive their score once each online quiz has closed

Weighting

40%

Minimum mark or grade

50%

Assessment Criteria

Each correct answer will be worth 1 mark (no marks will be deducted for incorrect answers). Answers for each quiz will be automatically marked upon submission. However, your grade for each quiz will only be released once the quiz has closed (as per the times and dates listed above).

Referencing Style

- [Vancouver](#)

Submission

Online

Submission Instructions

Online submission

Learning Outcomes Assessed

- Describe the structure, function and biological roles of the major types of biomolecules and macromolecules
- Describe the relationship between structure and function of the components of biological membranes, especially in terms of selective permeability
- Outline the basic processes involved in metabolic and catabolic pathways relevant to the cardiovascular system
- Describe basic cell signalling, communication and metabolism.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy

Examination

Outline

Complete an invigilated examination.

Date

During the examination period at a CQUniversity examination centre.

Weighting

60%

Length

180 minutes

Minimum mark or grade

50%

Exam Conditions

Closed Book.

Materials

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

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