



ECHO11004 *Biochemistry for Cardiac Pharmacology*

Term 2 - 2019

Profile information current as at 17/05/2024 12:55 pm

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 2 - 2019

- Online

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](#).

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 Unit evaluations, Emails

Feedback

The Online Quizzes were each comprised of 20 multiple choice questions and had to be completed in 30 minutes. Students felt that the time was too short.

Recommendation

The time for the Online Quizzes in 2019 will be increased from 30 minutes to 45 minutes.

Feedback from Unit evaluations, Emails

Feedback

Students felt that more immediate feedback on the Online Quizzes following completion of their attempt would have been beneficial.

Recommendation

The Quiz settings will be altered so that students can immediately see their score following completion of their attempt.

Feedback from Unit evaluations, Emails

Feedback

Students felt that some of the lectures were long and could have been "chunked" into smaller parts for ease of viewing.

Recommendation

The lectures are formatted into defined sections according to the weekly learning objectives. Thus, these sections will be used to split the lecture recordings into a series of videos of shorter duration in 2019.

Feedback from Unit evaluations, Emails

Feedback

Students appreciated the style of the Lectures / Tutorials and the learning resources provided on Moodle.

Recommendation

The teaching approach and resources will remain the same in 2019.

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 | | | | |
| 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% | • | • | • | • | | | | | | |
| 2 - Examination - 60% | • | • | • | • | | | | | | |

Textbooks and Resources

Textbooks

ECHO11004

Prescribed

Medical Biochemistry

Edition: 5th (2018)

Authors: John W Baynes and Marek H. Dominiczak

Elsevier

China

ISBN: 9780702072994

Binding: Paperback

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: [Vancouver](#)
For further information, see the Assessment Tasks.

Teaching Contacts

Jordon Irwin Unit Coordinator
j.irwin@cqu.edu.au

Schedule

Week 1 - 15 Jul 2019

| 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 - 22 Jul 2019

| 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 - 29 Jul 2019

| 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 - 05 Aug 2019

| 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 9:00 am (AEST) Friday 9th August 2019 |

Week 5 - 12 Aug 2019

| 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 16th August 2019 |

Vacation Week - 19 Aug 2019

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

Week 6 - 26 Aug 2019

| 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 9:00 am (AEST) Friday 30th August 2019 |

Week 7 - 02 Sep 2019

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|--|---|
| 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 6th September 2019 |

Week 8 - 09 Sep 2019

| Module/Topic | Chapter | Events and Submissions/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 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) | Tutorial on content from Week 8 |

Week 9 - 16 Sep 2019

| Module/Topic | Chapter | Events and Submissions/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 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)

Tutorial on content from Week 9
Online Quiz 3 opens 9:00 am (AEST)
Friday 20th September 2019

Week 10 - 23 Sep 2019

| Module/Topic | Chapter | Events and Submissions/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 25 (pp. 344-352) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition) | Tutorial on content from Week 10 Online Quiz 3 closes 5:00 pm (AEST) Friday 27th September 2019 |

Week 11 - 30 Sep 2019

| Module/Topic | Chapter | Events and Submissions/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 25 (pp. 339-344) Medical Biochemistry (J.W Baynes and M.H. Dominiczak, 5th Edition) | Tutorial on content from Week 11 Online Quiz 4 opens 9:00 am (AEST) Friday 4th October 2019 |

Week 12 - 07 Oct 2019

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|--|
| Revision | | Revision Tutorial Online Quiz 4 closes 5:00 pm (AEST) Friday 11th October 2019 Online Quizzes Due: Week 12 Friday (11 Oct 2019) 5:00 pm AEST |

Term Specific Information

Unit Coordinator and Contact details:

Your coordinator for ECHO11004 Biochemistry for Cardiac Pharmacology is Jordon Irwin. The most efficient and preferred method of contacting me is via the Q&A forum located on the unit Moodle site. Nevertheless, if your query is of a personal nature, please contact me directly via email (j.irwin@cqu.edu.au) or phone (0749232550).

Unit Content - Cardiac Focus

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 are placed in a "cardiac-specific" focus through the incorporation of a major weekly case study (on Fabry's disease), as well as other cardiac-focused examples. More information on this is provided in the "Unit orientation" and "Pre-term Lecture" videos on the Moodle site.

Unit Tutorials

Tutorials for this unit will be delivered "live" online using ZOOM (the links required for accessing the tutorials are provided on the Moodle site). The sessions will also be recorded and made available on Moodle. The tutorials are structured and will focus on answering the weekly study questions (these can be found on Moodle under each weekly tab).

Unit Study Commitment

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:

- 3 hours watching recorded lectures
- 2 hours reading the prescribed textbook chapter/s (and other resources where appropriate)
- 2 hours completing the weekly study questions
- 1 hour per week viewing the weekly tutorial
- 4 hours per week revising for quizzes/exam

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 (i.e. macromolecules, cell transport of materials, metabolic pathways as well as cell signalling /communication). Your knowledge of these concepts will be assessed via the completion of four (4) online quizzes. Each quiz is comprised of **20 multiple choice questions** and you will have **45 minutes** to attempt each quiz. Only **one attempt is permitted per quiz**; hence, please ensure that you have reviewed the relevant unit concept/s thoroughly prior to attempting each quiz.

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 opens and closes are outlined 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 9:00 am (AEST) on Friday 9th August 2019 (Week 4) and will be open until 5:00 pm (AEST) Friday 16th August 2019 (Week 5). This quiz will assess the topics covered during Weeks 1 to 4.
2. Quiz 2 will open at 9:00 am (AEST) on Friday 30th August 2019 (Week 6) and will be open until 5:00 pm (AEST) Friday 6th September 2019 (Week 7). This quiz will assess the topics covered during Weeks 5 to 6.
3. Quiz 3 will open at 9:00 am (AEST) on Friday 20th September 2019 (Week 9) and will be open until 5:00 pm (AEST) Friday 27th September 2019 (Week 10). This quiz will assess the topics covered during Weeks 7 to 9.
4. Quiz 4 will open at 9:00 am (AEST) on Friday 4th October 2019 (Week 11) and will be open until 5:00 pm (AEST) on Friday 11th October 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 (11 Oct 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 (11 Oct 2019)

Students will receive their score upon completion of their attempt

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.

Referencing Style

- [Vancouver](#)

Submission

Online

Submission Instructions

Answers will be automatically submitted upon completion of the 45 minute quiz period, or following manual submission by the student (i.e. clicking the "submit" button)

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).

No calculators permitted

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