# ECHO11004 *Biochemistry for Cardiac Pharmacology*
## Term 2 - 2020

Profile information current as at 24/04/2024 01:17 pm



## 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-requisiteBMSC11002 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 - 2020

- 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. **Online Test**
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 Coordinator

**Feedback**
Some lectures (while chunked) are over 120 minutes and include advanced topics which are not directly relevant to the unit learning outcomes.

**Recommendation**
The proportion of lectures with the advanced topics will be renewed.

#### Feedback from Student feedback

**Feedback**
The quiz questions should be formatted as "one per page" to avoid excessive scrolling.

**Recommendation**
The presentation of the quiz questions will be changed to one question per page.

#### Feedback from Student feedback

**Feedback**
Students enjoyed the diagrams and annotations provided in the lectures.

**Recommendation**
This presentation style will be retained.

## 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% | • | • | • | • |

| Assessment Tasks | Learning Outcomes | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| 2 - Online Test - 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 - Online Test - 60% | • | • | • | • | | | | | | |

## Textbooks and Resources

### Textbooks

ECHO11004

**Supplementary**

**Medical Biochemistry**
Edition: 5th edn (2018)
Authors: John W Baynes and Marek H. Dominiczak
Elsevier Health Sciences
Jamestown , UK
ISBN: 9780702072994
Binding: Paperback

**Additional Textbook Information**
If you prefer to study with a paper copy, they are available at the CQUni Bookshop here: http://bookshop.cqu.edu.au (search on the Unit code). eBooks are available at the publisher's website.

**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 - 13 Jul 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Macromolecules I - Carbohydrates. Cardiac link: Blood glucose levels (BGL). | Handbook provided on Moodle: Chapter 1 | Tutorial on Week 1 content. |

**Week 2 - 20 Jul 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Macromolecules II - Protein. Cardiac link: Coagulation factors. | Handbook provided on Moodle: Chapter 2 | Tutorial on Week 2 content. |

**Week 3 - 27 Jul 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Macromolecules III - Nucleic acids. Cardiac link: Genetic mutations in cardiovascular disease. | Handbook provided on Moodle: Chapter 3 | Tutorial on Week 3 content. |

**Week 4 - 03 Aug 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Macromolecules IV - Lipids.<br>Cardiac link: Prostaglandins in cardiovascular disease. | Handbook provided on Moodle: Chapter 4 | Tutorial on Week 4 content.<br>Online Quiz 1 opens 9:00 am (AEST) Friday 7th August 2020. |

**Week 5 - 10 Aug 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Cell transport I - Cell membranes.<br>Cardiac link: Special features of the cardiac cell membrane. | Handbook provided on Moodle: Chapter 5 | Tutorial on Week 5 content.<br>Online Quiz 1 closes 5:00 pm (AEST) Friday 14th August 2020. |

**Vacation Week - 17 Aug 2020**

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

**Week 6 - 24 Aug 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Cell transport II - Cell transport processes.<br>Cardiac link: Cell transport in cardiovascular disease. | Handbook provided on Moodle: Chapter 6 | Tutorial on Week 6 content.<br>Online Quiz 2 opens 9:00 am (AEST) Friday 28th August 2020. |

**Week 7 - 31 Aug 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Metabolism I - Catabolism of biomolecules (part 1).<br>Cardiac link: Creatine kinase as a biomarker of cardiovascular disease. | Handbook provided on Moodle: Chapter 7 | Tutorial on Week 7 content.<br>Online Quiz 2 closes 5:00 pm (AEST) Friday 4th September 2020. |

**Week 8 - 07 Sep 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Metabolism II - Catabolism of biomolecules (part 2).<br>Cardiac link: Carbohydrates and obesity. | Handbook provided on Moodle: Chapter 8 | Tutorial on Week 8 content. |

**Week 9 - 14 Sep 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Metabolism III - Metabolic regulation.<br>Cardiac link: Metabolic changes during left ventricular hypertrophy. | Handbook provided on Moodle: Chapter 9 | Tutorial on Week 9 content.<br>Online Quiz 3 opens 9:00 am (AEST) Friday 18th September 2020. |

**Week 10 - 21 Sep 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Cell communication and signalling I - Intercellular and intracellular communication.<br>Cardiac link: Paracrine signalling in cardiovascular disease. | Handbook provided on Moodle: Chapter 10 | Tutorial on Week 10 content.<br>Online Quiz 3 closes 5:00 pm (AEST) Friday 25th September 2020. |

**Week 11 - 28 Sep 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Cell communication and signalling II - Introduction to Pharmacology.<br>Cardiac link: Cardiovascular drugs. | Handbook provided on Moodle: Chapter 11 | Tutorial on Week 11 content.<br>Online Quiz 4 opens 9:00 am (AEST) Friday 2nd October 2020. |

**Week 12 - 05 Oct 2020**

| Module/Topic | Chapter | Events and Submissions/Topic |
|---|---|---|
| Revision. | N/A | Revision Tutorial.<br>Online Quiz 4 closes 5:00 pm (AEST) Friday 9th October 2020. |

## Term Specific Information

**Contacting the Teaching Staff**
Your teaching contact for ECHO11004 Biochemistry for Cardiac Pharmacology is Dr Jordon Irwin. The best way to contact Jordon is via the Q&A forum on the unit Moodle site. However, if your query is of a more personal nature please contact Jordon directly by email (j.irwin@cqu.edu.au).
The Q&A forum really is a great way to post questions related to the unit content, resources and assessment tasks. Please do not feel too shy to ask questions on the forum – you will not be alone in your query!
**Lectures and Tutorials**
All lectures for this unit are pre-recorded and will be available on the unit's Moodle site. Live tutorials will be delivered each week using Zoom - the links required for accessing the sessions are provided on the Moodle site. The tutorials will be recorded, and the links made available on the Moodle site. During these sessions, we will cover practice Online Quiz/Test questions to ensure that you are comfortable with answering the style of questions which form these assessment tasks.
**Textbook**
Purchasing the textbook associated with this unit (i.e. Medical Biochemistry 5th edn) is optional. This reference is only a recommended supplementary text for those students who would prefer to have an additional resource available to them.

**Unit Study Commitment**
As per Australian education standards, you are expected to commit 150 hours of engagement to your study of this unit. A suggestion of how you should allocate your study commitment per week is as follows:

- 2-3 hours watching recorded lectures and attending/viewing the tutorial.
- 1-2 hours completing the recommended readings.
- 2-3 hours completing the weekly study questions and practice assessment activities.
- 3-4 hours preparing for the Online Quizzes or Online Test.

## Assessment Tasks

### 1 Online Quizzes

**Assessment Type**
Online Quiz(zes)

**Task Description**
A sound knowledge of the biochemistry which underlies physiology and pharmacology is essential for medical imaging professionals. The purpose of this assessment task is to evaluate your understanding of the four major biochemistry topics covered in this unit: macromolecules, cell transport, metabolism and cell signaling/communication. Specifically, you are required to complete **four (4) online quizzes**:

- Each quiz is comprised of **20 questions**.
- The style of questions will be 'True/False' and 'Fill in the Blanks'.
- You will have **35 minutes** to attempt each quiz.
- Only **one (1) attempt** is permitted per quiz.
- Your score from each quiz will be combined, and the result will contribute 40% to your final grade.
- You are required to obtain at least 50% of the available marks to be eligible to pass the unit (i.e. > 40 out of 80 questions answered correctly).
- In the absence of an approved extension, there will be no opportunity to complete a quiz after it has closed.
- The specific dates that each quiz opens and closes are outlined below:

- Quiz 1 will open at 9:00 am (AEST) on Friday 07th August 2020 (Week 4) and will remain open until 5:00 pm (AEST) Friday 14th August 2020 (Week 5). This quiz will assess the topics covered during Weeks 1 to 4.
- Quiz 2 will open at 9:00 am (AEST) on Friday 28th August 2020 (Week 6) and will remain open until 5:00 pm (AEST) Friday 04th September 2020 (Week 7). This quiz will assess the topics covered during Weeks 5 to 6.
- Quiz 3 will open at 9:00 am (AEST) on Friday 18th September 2020 (Week 9) and will remain open until 5:00 pm (AEST) Friday 25th September 2020 (Week 10). This quiz will assess the topics covered during Weeks 7 to 9.
- Quiz 4 will open at 9:00 am (AEST) on Friday 02nd October 2020 (Week 11) and will remain open until 5:00 pm (AEST) on Friday 9th October 2020 (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**

The due dates for each quiz are listed in the Task Description section.

**Return Date to Students**

Results and feedback will be available via Moodle once each quiz has closed.

**Weighting**
40%

**Minimum mark or grade**
This assessment has a minimum passing grade of 50%.

**Assessment Criteria**
Each correct answer in the quiz will be awarded one (1) mark. No marks will be deducted for incorrect answers.

**Referencing Style**

- Vancouver

**Submission**
Online

**Submission Instructions**
Each quiz will be accessed and completed individually via Moodle.

**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

## 2 Online Test

**Assessment Type**
Online Test

**Task Description**
The ability to recall and apply fundamental biochemistry principles is a critical skill for individuals in the medical imaging profession. The purpose of this assessment task is to evaluate your understanding of the topics that we have covered in this unit (Weeks 1-11). Specifically, you will be required to complete **one (1) Online Test**.

- The test is comprised of **ten (10) questions** which will contain multiple sub-questions.
- The style of questions will be **short response**.
- Each question is worth a total of ten (10) marks. Hence, there are **100 marks** available in this assessment task.
- You will have **120 minutes** to complete the test (plus an additional 15 minutes perusal time).
- Only **one (1) attempt** is permitted for this assessment task.
- Your score from the Online Test will contribute 60% to your final grade.
- You are required to obtain at least 50% of the available marks to be eligible to pass the unit (i.e. $\geq$ 50 out of 100 marks).
- The Online Test will be held after the Term 2 2020 Course Review Period.
- If you are unable to complete the Online Test on the nominated date, you will have to apply for a Deferred Assessment.

**Assessment Due Date**

The exact time and date of the Online Test will be made available via Moodle once the University Online Examination Timetable has been finalised.

**Return Date to Students**

Results and feedback will be available following review by the unit coordinator.

**Weighting**
60%

**Minimum mark or grade**
This assessment has a minimum passing grade of 50%.

**Assessment Criteria**
The Online Test will consist of ten (10) questions each worth ten (10) marks. Marks will be awarded for correct responses. No marks will be deducted for incorrect answers.

**Referencing Style**

- Vancouver

**Submission**
Online

**Submission Instructions**
The Online test will be accessed and completed individually via Moodle.

**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

## 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