



# BMSC13015 *Molecular Targeted Therapies*

## Term 2 - 2018

Profile information current as at 30/04/2024 07:05 am

All details in this unit profile for BMSC13015 have been officially approved by CQUUniversity 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 enables you to develop an advanced knowledge and understanding of the principles of targeted therapies and their application in the treatment of human diseases. This unit will enhance your knowledge of genetics and the application of this to the molecular basis for disease development and progression. You will learn how the molecular genetics of human disease may lead to discoveries of biomarkers that can be used to predict an individual's response to specific therapies.

#### Details

Career Level: *Undergraduate*

Unit Level: *Level 3*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

#### Pre-requisites or Co-requisites

Pre-requisites: BIOL12107 Genomes, Genetics and Evolution AND BMSC12010 Clinical Biochemistry

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 - 2018

- Distance
- 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. **Written Assessment**

Weighting: 40%

#### 2. **Peer assessment**

Weighting: 10%

#### 3. **Examination**

Weighting: 50%

### 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 molecular alterations that can lead to the development and progression of human disease
2. Articulate how molecular targeted therapies are developed and describe their therapeutic applications
3. Appraise relevant literature to prepare and deliver a scientific presentation
4. Critically analyse scientific presentations and provide constructive feedback.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Written Assessment - 40%	•	•	•	
2 - Peer assessment - 10%				•
3 - Examination - 50%	•	•		

### 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 - Written Assessment - 40%	•	•	•	•		•				
2 - Peer assessment - 10%	•		•		•	•	•	•		

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
<b>3 - Examination - 50%</b>	•	•	•	•						

## Textbooks and Resources

### Textbooks

**There are no required textbooks.**

### 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 styles below:**

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)
- [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Paul Neilsen** Unit Coordinator

[p.neilsen@cqu.edu.au](mailto:p.neilsen@cqu.edu.au)

**Ingrid Christiansen** Unit Coordinator

[i.christiansen@cqu.edu.au](mailto:i.christiansen@cqu.edu.au)

## Schedule

### Week 1 - 09 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to personalised medicine and targeted therapies	Chapter 1 Textbook of Personalized Medicine (K.K. Jain, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) to welcome you to the unit and give you an overview of the structure of the delivery of the unit, the learning materials and assessments.
	Chapter 1 Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)	

### Week 2 - 16 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
HER2 inhibitors as targeted cancer therapies	Chapters 2 and 3 Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 1.

### Week 3 - 23 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic

Signal transduction pathways: PI3K, AKT and mTOR	Chapter 4 Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 2.
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#### Week 4 - 30 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Signal transduction pathways: BRAF, MEK and KIT	Chapters 5 and 6 Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 3.

#### Week 5 - 06 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Targeting cell death mechanisms in cancer - the p53 pathway	Chapter 12 Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 4.

#### Vacation Week - 13 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
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#### Week 6 - 20 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Targeting cell death mechanisms in cancer - BH3 mimetics and caspases	Chapter 12 Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 5.

#### Week 7 - 27 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Targeted therapies in the DNA repair pathways	Chapter 19 Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 6.

#### Week 8 - 03 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Hormonal antagonists as cancer therapies	Chapter 18 Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 7.  <b>Targeted Therapy Review Article</b> Due: Week 8 Friday (7 Sept 2018) 11:59 pm AEST

#### Week 9 - 10 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Immunotherapy	Chapter 15 Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 8.

#### Week 10 - 17 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Inhibitors of angiogenesis and other anti-vascular agents	Chapters 13 and 14 Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 9.

#### Week 11 - 24 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Targeted therapies in cardiovascular and neurological diseases	Chapters 12 and 14 Textbook of Personalized Medicine (K.K. Jain, 2nd Edition)	Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 10.

#### Week 12 - 01 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic
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Exam revision

Tutorial (Rockhampton campus with ZOOM live streaming) on content from Week 11 and exam preparation.

**Peer review** Due: Week 12 Friday (5 Oct 2018) 11:59 pm AEST

### Review/Exam Week - 08 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic
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### Exam Week - 15 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic
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## Term Specific Information

Your unit coordinator for BMSC13015 Molecular Targeted Therapies is Paul Neilsen. You can contact me using the forum on the unit's Moodle site or alternatively through email (p.neilsen@cqu.edu.au) or on 07 4930 9108. The forum for this unit is continuously monitored and you can expect a response within 24 hours of posting your question.

The lectures for this unit are delivered by Dr Kathleen Pishas, whom is an NHMRC Fellow and an industry expert in targeted cancer therapies. These weekly lectures will be recorded and available on the unit's Moodle site. Weekly tutorials will be delivered by the unit coordinator (Paul Neilsen) from the Rockhampton campus with ZOOM live streaming available for students enrolled in distance delivery mode. During these tutorials, we will work through the weekly study questions that are provided to you on the Moodle site. These weekly study questions will help you apply knowledge learned during the weekly lecture and prepare you for the assessments. You will get the most benefit from the tutorials if you watch the weekly lectures beforehand and attempt the weekly study questions. You are strongly encouraged to participate in tutorials.

As per Australian educational standards, you are expected to commit 150 hours of engagement to your study of this unit. This is broken down as:

- 2 - 3 hours per week watching recorded lectures and revising the content through study notes
- 3 - 4 hours per week completing the weekly study questions on the unit's Moodle site.
- 1 - 2 hours per week attending the weekly tutorial and reflecting on your answers to the weekly study questions
- 3 - 4 hours per week preparing your assessments or studying for your exams

The content for this unit involves two ebooks which are freely available from the CQUniversity library as online resources:

- Targeted Therapies in Oncology (G. Giaccone and J. Soria, 2nd Edition)
- Textbook of Personalized Medicine (K. K. Jain, 2nd Edition)

## Assessment Tasks

### 1 Targeted Therapy Review Article

#### Assessment Type

Written Assessment

#### Task Description

This unit provides you with an opportunity to develop a deep appreciation for the etiology that underpins diseases that are caused by specific genetic or molecular alterations, and the highly-specific targeted therapies that have been developed to treat these diseases. The ability to critically analyze a vast body of literature on a particular disease or therapeutic is an essential skill required by those in the biotechnology or medical research professions. In this assessment, you will be provided an opportunity to write a short **review article** on a particular targeted therapy. This will involve:

- Select **one (1)** targeted therapy that has been shown to have efficacy in the treatment of human disease(s).
- Describe the specific molecular alterations that this therapy was developed to target. You are encouraged to provide a detailed explanation regarding how this particular molecular or genetic alteration is the driving etiology of the disease(s).
- Discuss the mechanism of action of the therapeutic. Is it inhibiting its target in cells?

- Using the lecture content as a guide, identify which cellular pathway is affected by this molecular or genetic alteration. You should also describe the downstream consequences of targeting this alteration with your selected therapy.
- Describe the side-effects associated with the clinical use of this targeted therapeutic. Are these considered as "on-target" or "off-target" effects?
- Lastly, you should appraise the literature to identify similar targeted therapies and critically discuss the advantages or disadvantages of your selected therapeutic in comparison to its competitors.

This review article should be prepared in a format suitable for publication in a scientific journal. You are encouraged to include figures (adapted from other review articles and cited accordingly) or tables as required. It is expected that your review article should contain between 25 to 35 references and between 2,500 to 3,500 words in length (excluding references, tables or figure legends).

#### **Assessment Due Date**

Week 8 Friday (7 Sept 2018) 11:59 pm AEST

#### **Return Date to Students**

Week 9 Friday (14 Sept 2018)

#### **Weighting**

40%

#### **Minimum mark or grade**

50%

#### **Assessment Criteria**

Your review article will be assessed on the following criteria:

##### **Scientific Content:**

- Ability to concisely review and interpret the literature on your selected targeted therapy
- Demonstration of a high level of understanding of the molecular or genetic alteration that this therapy is developed to target.
- A comprehensive knowledge on the etiology of the disease(s) that this targeted therapy is indicated for
- Clear ability to critically analyze the literature surrounding the pre-clinical and clinical research conducted on this targeted therapy.
- Comprehensive understanding of the class of therapeutic and its advantages or disadvantages when compared to competitors in the market
- Appropriate selection and use of key references
- Accurate interpretation to the literature and factual correctness on topics discussed.

##### **Presentation and formatting:**

- Adherence to Harvard or APA referencing styles
- Adherence to other formatting requirements such as word limit and number of references
- Clarity of the review article
- Structure and flow of the review article
- Quality and reliability of sources of literature referenced

A detailed marking rubric and assessment guidelines will be available on the unit's Moodle site.

#### **Referencing Style**

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)
- [Harvard \(author-date\)](#)

#### **Submission**

Online

#### **Submission Instructions**

Please submit as a word or pdf document through the assessment submission link on the unit's Moodle site

#### **Learning Outcomes Assessed**

- Describe the molecular alterations that can lead to the development and progression of human disease
- Articulate how molecular targeted therapies are developed and describe their therapeutic applications
- Appraise relevant literature to prepare and deliver a scientific presentation

#### **Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

## 2 Peer review

### Assessment Type

Peer assessment

### Task Description

Publication of pre-clinical or clinical research is common practice in the biotechnology or medical research professions. Such publications undergo rigorous scrutiny from editorial boards of journal and peer reviewers from the scientific community. In this assessment, you will have a simulated experience as a reviewer for a journal. In this role, you will demonstrate your ability to critically analyze a scientific review article and provide constructive feedback.

You will be provided with **two (2)** of your peers' review articles (deidentified) that were submitted for Assessment 1. You will also be provided with guidelines regarding the review process and asked to provide a **1 page written report** on each review article. This report will:

- Highlight the strengths and weaknesses of the review article
- Determine if the review describes a comprehensive account of the literature
- Identify any key articles that should be incorporated in the review article (if appropriate)
- Provide suggested corrections (major or minor) for the review article (if appropriate). If you conclude that no corrections or changes to the review article is required, then you must justify this through clearly highlighting the strengths of the article.

Your 1 page reports must be prepared using **constructive and positive feedback**. Your report will not influence the grades of your peers' review article from assessment 1, however it will be provided to them as a deidentified feedback file.

### Assessment Due Date

Week 12 Friday (5 Oct 2018) 11:59 pm AEST

### Return Date to Students

Review/Exam Week Friday (12 Oct 2018)

### Weighting

10%

### Assessment Criteria

You will submit two reports, both of 1 page in length. They are worth 5% each and will be graded by the unit coordinator using the following criteria:

- Accurate identification and description of the strengths and weaknesses of the review articles
- Demonstration of a high level of understanding of the review article topic throughout the report.
- Identification of key literature related to the topic of the review article (the specific targeted therapy)
- Provision of a clear and justified set of corrections supported by additional literature as deemed appropriate
- Adherence to the Harvard or APA referencing styles and other formatting requirements set in the guidelines
- Clarity of the report
- Structure and flow of the report

A detailed marking rubric and assessment guidelines will be available on the unit's Moodle site.

### Referencing Style

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)
- [Harvard \(author-date\)](#)

### Submission

Online

### Learning Outcomes Assessed

- Critically analyse scientific presentations and provide constructive feedback.

### Graduate Attributes

- Communication
- Critical Thinking
- Team Work



- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

## Examination

### **Outline**

Complete an invigilated examination.

### **Date**

During the examination period at a CQUniversity examination centre.

### **Weighting**

50%

### **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