



# BMSC13015 *Molecular Targeted Therapies*

## Term 2 - 2021

Profile information current as at 28/04/2024 07:11 am

All details in this unit profile for BMSC13015 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 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 - 2021

- Online
- Rockhampton

### Attendance Requirements

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

### Website

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

## Class and Assessment Overview

### Recommended Student Time Commitment

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

### Class Timetable

#### [Regional Campuses](#)

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

#### [Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

### Assessment Overview

#### 1. **Written Assessment**

Weighting: 40%

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

Weighting: 10%

#### 3. **Online Test**

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](#).

## Previous Student Feedback

### Feedback, Recommendations and Responses

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

#### Feedback from Student Feedback and Self Reflection

##### Feedback

The content in some lectures was beyond the level of knowledge required for this unit.

##### Recommendation

Update lecture content to reflect the depth of knowledge required for this unit.

#### Feedback from Student Feedback

##### Feedback

Providing student-focused tutorials as needed, was beneficial to student learning.

##### Recommendation

Continue to provide live student focused tutorials.

## 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 - Online Test - 50%	•	•		

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Communication	•	•	•	

Graduate Attributes	Learning Outcomes			
	1	2	3	4
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%	•		•		•	•	•	•		
3 - Online Test - 50%	•	•	•	•						

## 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:

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Jason Steel** Unit Coordinator  
[j.steel@cqu.edu.au](mailto:j.steel@cqu.edu.au)

## Schedule

### Week 1 - 12 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Personalised Medicine and Targeted Therapies		ZOOM Tutorial on content from Week 1

### Week 2 - 19 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
HER2 Inhibitors as Targeted Cancer Therapies		ZOOM Tutorial on content from Week 2

### Week 3 - 26 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Signal Transduction Pathways: PI3K, AKT and MTOR		ZOOM Tutorial on content from Week 3

### Week 4 - 02 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Signal Transduction Pathways: BRAF, MEK and KIT		ZOOM Tutorial on content from Week 4

### Week 5 - 09 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Targeting Cell Death Mechanisms in Cancer: The p53 Pathway		ZOOM Tutorial on content from Week 5

### Vacation Week - 16 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
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### Week 6 - 23 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
Targeting Cell Death Mechanisms in Cancer: BH3 Mimetics and Caspases		ZOOM Tutorial on content from Week 6

### Week 7 - 30 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
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ZOOM Tutorial on content from Week 7

Targeted Therapies in the DNA Repair Pathways

**Targeted Therapy Review Article**  
Due: Week 7 Friday (3 Sept 2021)  
11:45 pm AEST

#### Week 8 - 06 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Hormonal Antagonists as Cancer Therapies		ZOOM Tutorial on content from Week 8

#### Week 9 - 13 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Gene Therapy		ZOOM Tutorial on content from Week 9

**Peer Review** Due: Week 9 Friday (17 Sept 2021) 11:45 pm AEST

#### Week 10 - 20 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Immunotherapy		ZOOM Tutorial on content from Week 10

#### Week 11 - 27 Sep 2021

Module/Topic	Chapter	Events and Submissions/Topic
Inhibitors of Angiogenesis and other anti-Vascular Agents		ZOOM Tutorial on content from Week 11

#### Week 12 - 04 Oct 2021

Module/Topic	Chapter	Events and Submissions/Topic
Exam Revision		ZOOM Tutorial - exam revision

#### Review/Exam Week - 11 Oct 2021

Module/Topic	Chapter	Events and Submissions/Topic
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#### Exam Week - 18 Oct 2021

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

The coordinator for this unit is Dr Jason Steel. Please feel free to contact Dr Steel on [j.steel@cqu.edu.au](mailto:j.steel@cqu.edu.au) or on 07 4930 6391 or via Moodle forum. The forum for this unit is continuously monitored and you can expect a response within 48 hours of posting your question.

The lectures for this unit are delivered by Dr Kathleen Pishas, who is a 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 facilitated by Dr Jason Steel. 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.

The content for this unit involves three 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)
- Principles of Molecular Diagnostics and Personalized Cancer Medicine (D. Tan and H.T. Lynch)

## Assessment Tasks

### 1 Targeted Therapy Review Article

#### Assessment Type

Written Assessment

#### Task Description

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).

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. For this assessment, you will be required to:

- 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.

#### Assessment Due Date

Week 7 Friday (3 Sept 2021) 11:45 pm AEST

#### Return Date to Students

Assessment grade and feedback will be provided within 2 weeks of submission.

#### 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

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

### 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 are 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 de-identified feedback file.

### Assessment Due Date

Week 9 Friday (17 Sept 2021) 11:45 pm AEST

### Return Date to Students

Assessment grade and feedback will be provided within 2 weeks of submission.

### 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**

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

### **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

## **3 End of Term Online Test**

### **Assessment Type**

Online Test

### **Task Description**

This final assessment will be an online test. Questions for this test will be based on material covered in lectures and tutorials from the entire term.

The final assessment is worth 50% of your overall mark for the unit.

### **Assessment Due Date**

The end of term online test will be conducted during the end of term exam period. Students will be advised of a date and time via Moodle.

### **Return Date to Students**

Within 2 weeks of submission

### **Weighting**

50%

### **Assessment Criteria**

For the final assessment, your responses are scored according to the following criteria:

- correctness, relevance and completeness of the response to the question asked.

### **Referencing Style**

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

### **Submission**

No submission method provided.

### **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

### **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