



# BIOL115

## Genes to Organisms

S2 Day 2017

*Dept of Biological Sciences*

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#### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

## General Information

Unit convenor and teaching staff

Unit Convenor

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Kate Barry

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Credit points

3

Prerequisites

Corequisites

Co-badged status

### Unit description

This unit deals with the nuts and bolts of life on earth. Throughout the unit there is a single unifying theme – that all of the processes that give rise to life are derived from DNA. We show students that DNA controls life by acting as a blueprint for the construction of proteins, and that those proteins build cells which act as the basic structural and functional units of all life. To demonstrate these processes to students, we start by talking about the structure and function of DNA to show how it can act as a simple code for the construction of proteins. Students are then shown how proteins are constructed from the DNA code, and how those proteins can be used to build and maintain cells. Having established these basic principles, the unit then goes on to explain how cells construct multicellular organisms during development, and how the proper functioning of those organisms is maintained by regulating cellular activity. We also demonstrate that the DNA code is essentially immortal because it can be copied from generation to generation, from cell to cell.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://students.mq.edu.au/important-dates>

## Learning Outcomes

1. Define how biological information is encoded in the structure of the genetic molecule, DNA
2. Explain the flow of biological information in living systems
3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
5. Describe how genetic information is transmitted through the generations, and the evolutionary process
6. Discuss modern applications of genetics and genomics
7. Analyse scientific data and use the basic elements of scientific writing to write reports

## General Assessment Information

### Assignment submission, Turnitin and Plagiarism

This is a paperless unit so no assignments or quizzes will be physically handed in. You will be required to submit all assignments through iLearn via a Turnitin link. Turnitin is an online program that detects plagiarised pieces of work. It compares not only work between students in the current year but also across previous years, across institutions, with all published materials, and the internet. It is an incredibly effective tool. So do yourself a favour and write your work in your own words – in fact it is a requirement for all assignments in the course that they be written

in your own words. Do not under any circumstances lend your work to another student. If that student plagiarises your work you too will be liable. Do not copy and paste text into your document with the thought you will modify it later – you will forget! Lastly do not leave things to the last moment, as that is when the urge to plagiarise hits you most.

The penalties imposed by the University for plagiarism are serious and may include expulsion from the University. ANY evidence of plagiarism WILL be dealt with according to University policy.

Plagiarism involves using the work of another person and presenting it as one's own. A full outline of the Universities policy on plagiarism is found at [http://www.mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://www.mq.edu.au/policy/docs/academic_honesty/policy.html). The website includes a general discussion of plagiarism, definitions, examples drawn from concrete cases, procedures that will be followed by the University in cases of plagiarism, and recommended penalties. Students are expected to familiarise themselves with the website.

### **Extensions and penalties**

10% will be deducted for each day an assignment is late, including each day of a weekend. If you are unable to submit the assignment by the due date then an extension must be sought before the due date unless this is absolutely impossible. You will be asked to submit a Disruption to studies request via [ask.mq.edu.au](http://ask.mq.edu.au) (see “What to do if you miss...” below).

### **WHAT TO DO IF YOU MISS AN ASSIGNMENT TASK OR PRACTICAL SESSION**

Through:

Illness, misfortune, or special events

- Submit request for Disruption to Studies via [ask.mq.edu.au](http://ask.mq.edu.au) (Do not give doctors certificates to lecturers or tutors).
- You will need to provide documentation for illness. You cannot provide a medical certificate to [ask.mq.edu](http://ask.mq.edu) – you must have the doctor complete a Professional Authority form ([www.mq.edu.au/.../Form\\_Disruption%20to%20Studies\\_PAF.pdf](http://www.mq.edu.au/.../Form_Disruption%20to%20Studies_PAF.pdf)). If you do not submit this form with the request, the Disruption to Studies request will be declined by [ask.mq.edu.au](http://ask.mq.edu.au) without ever being sent to the course convener.
- For other situations you must provide a supporting letter explaining the circumstances that led to you missing the practicals ([http://www.mq.edu.au/policy/docs/disruption\\_studies/schedule\\_evidence.html](http://www.mq.edu.au/policy/docs/disruption_studies/schedule_evidence.html)).
- Inform the course convener (via the [biol115@mq.edu.au](mailto:biol115@mq.edu.au) email address) that you have submitted consideration.
- The course convener will process your Disruption to Studies request. If approved it is your responsibility to arrange with the course convener (via the [biol115@mq.edu.au](mailto:biol115@mq.edu.au)

email address) to do your assignment or practical at another time.

- If you are sick on the day of your practical but are fine the next day, and there are practicals on, you may attend these practicals to catch up. You must however ensure that the course convenor has agreed to this prior to practical attendance. This is your responsibility.

Neglect (i.e. forgot or just slack)

- Be honest!
  - Contact the course convener (via the [biol115@mq.edu.au](mailto:biol115@mq.edu.au) email address) to plead your case. Email Protocol...
1. Be courteous i.e. address the intended reader appropriately and say thank you!
  2. We endeavour to reply to emails in a timely fashion, but will only be checking and responding Monday through Friday, during working hours.

## PRAC ATTENDANCE

You are expected to attend 70% of all practical classes.

## UNIT REQUIREMENTS

To pass this unit you must achieve an overall score of 50% or greater.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Practical quizzes</a>	10%	No	Weekly
<a href="#">Database Project</a>	10%	No	Ongoing until 27/10/2017
<a href="#">Mid-semester Test</a>	15%	No	04/09/17 or 19/09/17
<a href="#">Paper Dissection</a>	25%	No	6/10/17
<a href="#">Final Exam</a>	40%	No	TBA

## Practical quizzes

Due: **Weekly**

Weighting: **10%**

Pre-prac quizzes to test preparedness and comprehension.

This Assessment Task relates to the following Learning Outcomes:

- 1. Define how biological information is encoded in the structure of the genetic molecule, DNA
- 2. Explain the flow of biological information in living systems
- 3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process

## Database Project

Due: **Ongoing until 27/10/2017**

Weighting: **10%**

The PeerWise database will be available to students throughout the Session. Students must write and submit at least five questions based upon lecture content, and answer at least five.

This Assessment Task relates to the following Learning Outcomes:

- 2. Explain the flow of biological information in living systems
- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

## Mid-semester Test

Due: **04/09/17 or 19/09/17**

Weighting: **15%**

The mid-semester test will consist of multiple choice and short answer questions covering all lecture material up to and including Lecture 10. The test will be conducted under exam conditions, that is, silently and with no communication between students. All written material, programmable calculators, mobile phones or electronic tablets will be required to be set to the side of the exam room.

This test will occur in the normal lecture theatre, during lecture hours. For externals, the test will be held at OCS2 on September 19.

This Assessment Task relates to the following Learning Outcomes:

- 1. Define how biological information is encoded in the structure of the genetic molecule, DNA
- 2. Explain the flow of biological information in living systems
- 3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process

## Paper Dissection

Due: **6/10/17**

Weighting: **25%**

A library of at least 10 public research papers will be made available to students. Students must select one paper (or choose a paper in which they are interested, with the approval of the convenors) and analyse the structure, underlying research, and implications of the paper, following the set of questions provided. The results must be written up in the form of a report of no more than three pages.

This Assessment Task relates to the following Learning Outcomes:

- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

## Final Exam

Due: **TBA**

Weighting: **40%**

Assesses all material covered in practicals as well as the material in all lectures.

This Assessment Task relates to the following Learning Outcomes:

- 1. Define how biological information is encoded in the structure of the genetic molecule, DNA
- 2. Explain the flow of biological information in living systems
- 3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process

- 6. Discuss modern applications of genetics and genomics

## Delivery and Resources

### How to find the answers

1. Read the unit outline
2. Consult iLearn (often the majority of questions have already been asked)
3. All questions on lecture content should be posted on the iLearn forum. We will be monitoring the iLearn forum and ensuring all questions are correctly answered. If the answer to any course-related question will benefit the many please post it on iLearn.
4. Please email [biol115@mq.edu.au](mailto:biol115@mq.edu.au) if you have any questions about:
  1. organising alternative times for assessments or extensions
  2. withdrawal from the unit
  3. personal issues affecting your study
  4. assignment dates
  5. practical class allocations
  6. mark queries
5. Please only approach Tutors with questions throughout practical sessions
6. Please only approach Lab technician during practical classes and only with technical questions
7. Unexpected adjustments made during the course will announced via iLearn announcements so make sure you check iLearn regularly.

### iLearn

The primary means of communication for this unit is via iLearn™ and email ([biol115@mq.edu.au](mailto:biol115@mq.edu.au)). iLearn is a web-based computer-mediated communication package and can be accessed by most web browsers from inside or outside the University.

We expect you to use iLearn for:

- Regularly checking subject announcements (at least twice per week)
- Discussing the unit and its content with staff and other students
- Downloading Lecture and Practical materials



- Downloading reference materials

## Logging in to iLearn

The URL for the iLearn login page is: <https://ilearn.mq.edu.au/>

You will need to log in to iLearn each time you use it. Your user name is your student number. If you are having trouble accessing your online unit due to a disability or health condition, please visit the Student Services Website [http://students.mq.edu.au/support/health\\_and\\_wellbeing/](http://students.mq.edu.au/support/health_and_wellbeing/) for information on how to get assistance. If you are having problems logging on after ensuring you have entered your username and password correctly, you should contact Student IT Help, [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

## TEXTBOOK - CAMPBELL BIOLOGY TENTH EDITION ANZ EDITION

This textbook is compulsory and is used for both Biol114 and Biol115. It is available in hard copy from the Co-op Bookshop (ISBN 9781486007042), or electronically at <http://www.pearson.com.au/9781486012299>. The electronic version is considerably less expensive.

## Unit Schedule

### Lectures

Lecture 1	Monday	11:00 - 12:00	<a href="#"><u>21 Wallys Walk (W2.4A) Macquarie Theatre</u></a>
Lecture 2	Monday	12:00 - 13:00	<a href="#"><u>21 Wallys Walk (W2.4A) Macquarie Theatre</u></a>

### Practicals - 6 Wallys Walk E8C Science Labs

Monday 13:00 - 16:00

Tuesday 10:00 - 13:00

Tuesday 14:00 - 17:00

Wednesday 10:00 - 13:00

Wednesday 14:00 - 17:00

Thursday 9:00 - 12:00

### External Practicals

Saturday 26 August 9:00 - 17:00

Tuesday 19 September 9:00 - 17:00

Wednesday 20 September 9:00 - 17:00

Saturday 21 October 9:00 - 17:00

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

Assessment Policy [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html)

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy (in effect until Dec 4th, 2017): [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html)

Special Consideration Policy (in effect from Dec 4th, 2017): <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](http://ask.mq.edu.au).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## Student Enquiry Service

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

## Equity Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Graduate Capabilities

### Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

### Learning outcomes

- 1. Define how biological information is encoded in the structure of the genetic molecule, DNA
- 2. Explain the flow of biological information in living systems
- 3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

### Assessment tasks

- Practical quizzes
- Database Project
- Mid-semester Test

- Paper Dissection
- Final Exam

## Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

### Learning outcomes

- 3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

### Assessment tasks

- Practical quizzes
- Database Project
- Mid-semester Test
- Paper Dissection
- Final Exam

## Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

### Learning outcomes

- 2. Explain the flow of biological information in living systems
- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of

organelles

- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

## Assessment tasks

- Database Project
- Mid-semester Test
- Paper Dissection
- Final Exam

## Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

## Learning outcomes

- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

## Assessment tasks

- Database Project
- Mid-semester Test
- Final Exam

## Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

## Learning outcomes

- 1. Define how biological information is encoded in the structure of the genetic molecule, DNA

- 2. Explain the flow of biological information in living systems
- 3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

## **Assessment tasks**

- Practical quizzes
- Database Project
- Mid-semester Test
- Paper Dissection
- Final Exam

## **Creative and Innovative**

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

## **Learning outcomes**

- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

## **Assessment tasks**

- Database Project
- Mid-semester Test
- Final Exam

## **Engaged and Ethical Local and Global citizens**

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should

have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

### **Learning outcomes**

- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics

## **Socially and Environmentally Active and Responsible**

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

### **Learning outcomes**

- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

## **Commitment to Continuous Learning**

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

### **Learning outcomes**

- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics

## **Changes from Previous Offering**

Practical quizzes have been extended, and will only run before the practical sessions

Practicals have changed from three to two hours (on average) in length

Assignments have been modified

Overall breakdown of marks has changed slightly

## Changes since First Published

Date	Description
28/07/2017	External midsemester test date added
10/07/2017	Updated OCS date