Molecular Genetics 631

Image from the University of Miami Department of Biology

Semester 1, 2012
Welcome

Welcome to Molecular Genetics 631. Molecular genetics (or biology) is one of the most exciting and rapidly developing areas of science, providing an understanding of how our body functions and the underlying mechanisms of many human, animal and plant diseases.

If you want to discuss anything with me, or require anything explained, please don’t hesitate to contact me. Email is the best way to let me know you need to speak with me, and from there we can arrange a face-to-face or phone meeting. I am more than happy to give you extra help to understand the material in the unit. However, please help me to help you by suggesting what you think the answer is first!

I also encourage you to discuss ideas, ask questions, and solve problems with the other students enrolled in the unit. A discussion/bulletin board is located on the unit FLECS-Blackboard site to make this easier for you.

I hope you will find this unit interesting, challenging and above all enjoyable.

Kylie Munyard  
Unit Coordinator
## Unit Details

<table>
<thead>
<tr>
<th>Unit Index No:</th>
<th>6756</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area responsible:</td>
<td>School of Biomedical Sciences</td>
</tr>
<tr>
<td>Credit points:</td>
<td>25</td>
</tr>
<tr>
<td>Mode:</td>
<td>Internal- Core unit</td>
</tr>
<tr>
<td>Pre-requisite Units:</td>
<td>Relevant undergraduate biology units (or equivalent).</td>
</tr>
</tbody>
</table>
| Additional Prerequisites | • Ability to effectively source, access, and use library resources (printed and electronic).  
• Ability to critically evaluate scientific literature and information.  
• Familiarity with the use of email, Bulletin Boards, and possession of web-searching skills (use of Search engines). |
| Result type:        | Grade/Mark      |
| Unit Coordinator:   | Dr Kylie Munyard |
| Office location:    | 308.202         |
| Email:              | K.Munyard@curtin.edu.au |
| Phone:              | (08) 9266 7519  |
| Fax:                | (08) 9266 2342  |

## Syllabus

Molecular genetics has drawn together the more traditional sciences of genetics, biochemistry, microbiology, and cell biology. This unit is designed to enable the student to gain an understanding of the structure and function of genetic information (i.e. DNA). How DNA determines and regulates the structure and function of proteins, cells, and ultimately the organism as a whole will be studied. The emphasis is on understanding and critical thinking skills, rather than rote learning, and this will be reflected in the continuous assessments.

## Study Load

There is a 2-hour lecture each week. This will be held on Tuesdays between 10am and 12noon in room 400.219. A one hour tutorial will be held, in the same location, after the lecture. Note that when a Module Quiz is scheduled, it will commence at 10am, and after a short break, will be followed by the scheduled lecture.

You will need to spend a total of about **12 hours per week** in-class and at-home study-time to be successful in this unit.

## Learning Style

Lectures, tutorials, self-directed, and collaborative learning will all be used to help you achieve the desired outcomes in this unit.
**Unit Website**  
You will need to access Web-based Resources via the FLECS-Blackboard Home Page at: http://lms.curtin.edu.au  
Use your Curtin Student Number as username and D.O.B as password when you first access the site.

**Unit Outcomes**

**Learning Outcomes**  
On successful completion of this unit you will be able to:

1. Critically evaluate scientific literature as it relates to topical issues in molecular genetics (Graduate Attribute 3).
2. Communicate effectively in a scientific manner, through written and oral presentations (Graduate Attribute 4).
3. Describe the molecular basis of cellular processes and features (Graduate Attribute 1).
4. Explain how information contained in DNA controls the functions of the body (Graduate Attribute 1).

On successful completion of this unit you will have completed tasks that will have led you to develop the following skills:

- Effectively communicated with Staff and other Students.
- Produced written articles and oral presentations that communicate scientifically.
- Used available technology to prepare and present information.
- Accessed, analysed and critically evaluated relevant information from a variety of sources.
- Combined new and old information to make decisions based on reasoned argument.

**Assessment Tasks**

To pass this unit you must complete the assessment tasks listed below.

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Marks</th>
<th>Due Date (5pm Monday)</th>
<th>Outcomes Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Module Quizzes x 3</td>
<td>70%</td>
<td>Wks 5, 9 &amp; 13</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>2. Written Assignment</td>
<td>15%</td>
<td>Wk 4 &amp; Wk 6</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>3. Debate</td>
<td>15%</td>
<td>Wk 12</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
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</table>

A mark of 50% or greater is required in order to pass this unit. You must attempt all assessment tasks. Failure to pass any of the assessment tasks may result in a fail for the unit.
It is necessary to demonstrate attainment of each learning and professional outcome to achieve a pass in this unit. Due dates have been selected in order to minimise overlap, spread the workload and allow timely feedback. Late submission of an assessment will incur a 10% per day (or part thereof) deduction, except where special dispensation has been granted.

**Assessment Task Details**

1. **Module Tests (70%)**
   There will be three module tests spaced throughout this semester. The first test covers the material you will learn in weeks 2 to 4 (20%), the second test weeks covers 5 to 8 (20%), and the third test covers weeks 9 to 12 (30%). Each test will consist of multiple-choice questions and short-answer questions (e.g. short written answer, match the phrases, true/false, insert the correct word). The tests will examine your understanding of the topics covered. No notes or other aids will be allowed. All tests must be attempted.

2. **Written Assignment (15%)**
   You will be given a document with the summary removed. Your task is to write a summary for the document. This task will be done in two parts to help you understand it properly. The first part will be to write a list of the key points from the document (due week 4). The second is to turn that list into a written summary (due week 7). Because this is one of the first writing tasks that you do as part of this course, you will be given the opportunity to hand in a first attempt, then use feedback from that attempt to improve your assignment before it gets graded. More information will be given to you in the “how to write a Summary”, “Summary interim session” and “feedback on Summary” tutorial sessions in weeks 2, 4 and 8.

3. **Debate (15%)**
   One of the skills you will need as a scientist is the ability to critically examine the work of others, and that includes verbal and written reporting of that analysis. You will also need to know how to present and defend your own research at conferences and meetings. A debate topic will be given to you, and team members will display their critical analysis and research skills during a formal debate. Marks will be awarded by a panel of Staff who attend the debate. More details will be provided during the “planning a debate” tutorial. The debate is compulsory; failure to demonstrate a significant contribution to a debate team will result in a fail for this unit.

**Unit Materials**

**Recommended Text**
   The recommended text for this unit is Human Molecular Genetics 3, by Tom Strachan and Andrew P. Read, published by Garland Science (ISBN: 0-8153-4184-9). It is available for sale in the Bookshop. Older versions of this text (e.g. version 2) and any other Human Molecular Genetics textbooks are also suitable.

**Other Reference Books (Available online)**
Other Resources
You will be expected to research a number of topics related to course materials using the web, and professional journals held in the Curtin, Murdoch and UWA libraries.

While you are encouraged to use the internet to find reference material, please be aware that non-peer reviewed material from the web is not considered a reputable source of information. Just because it is published on the web doesn’t mean that it is correct! Your main sources of information should be journal articles, reviews and textbooks.

University Policies
This unit is subject to the following policies:

- The University statement on the nature and unacceptability of academic dishonesty including cheating, plagiarism and the fabrication or falsification of data.
- The University statement on individual rights and responsibilities regarding the proper use of copyright material.
- Student Charter. This Charter states the expectations of students and staff in their interactions as members of the Curtin community.
- Grievance Procedures. This policy covers “Any real or perceived ground for complaint including perceived racial or sexual harassment; discrimination on the grounds of disability, race, religious belief, political viewpoint, sex, marital status or pregnancy; or any other unfair or improper treatment.”
- Appropriate ICT (computer and internet) use.

It is your responsibility to familiarise yourself with these policies, details of which can be found at:
http://students.curtin.edu.au/administration/responsibilities.cfm

Academic Integrity
The Academic Integrity website provides information and resources for students on the topic of academic integrity (e.g. cheating, plagiarism, collusion, falsification of data). It has downloadable booklets and links to policies and procedures related to student (and staff) responsibilities and rights.
http://academicintegrity.curtin.edu.au

The University places the highest importance on the principles underpinning academic integrity and requires that its staff and students behave in accordance with these principles at all times. Academic scholarship necessarily requires building on the work of others; however, the use of others’ work must be acknowledged appropriately. Plagiarism devalues the quality of learning both for the individual and for others enrolled in a course. It can compromise the integrity of University awards and, in extreme cases, damage the University’s National and International reputation.

Plagiarism
Plagiarism is a very serious offence, and in severe cases can result in expulsion from the University. It is your responsibility to inform yourself of the University’s plagiarism policy. A comprehensive booklet is available as a pdf from the Academic Integrity website. Useful examples and explanations of plagiarism are given in the
booklet. Ignorance of the plagiarism policy will not be considered to be a useful defense if you are charged with plagiarism. **If you are in any doubt as to what constitutes plagiarism, or how to avoid plagiarizing, please ask the unit coordinator for help.**

**Actions Which Constitute Plagiarism**

Plagiarism means presenting the work, ideas or property of another person as one’s own, without appropriate acknowledgement or referencing. Plagiarism includes, but is not limited to;

i. copying of sentences, paragraphs or creative products which are the work of other persons (including books, articles, theses, unpublished works, working papers, seminar and conference papers, internal reports, lecture notes or tapes) without due acknowledgment;

ii. too closely paraphrasing sentences, paragraphs or themes without due acknowledgment;

iii. using another person’s work/s (including words, music, computer source code, creative or visual artifacts, designs or ideas) or research data without due acknowledgment;

iv. submitting work which has been produced by someone else (e.g. allowing or contracting another person to do the work for which you claim authorship);

v. copying or submitting computer files, code or website content in whole or in part without indicating the origin of these;

vi. submitting one’s own previously assessed or published work for assessment or publication elsewhere, without appropriate acknowledgement (self-plagiarism);

vii. in the case of collaborative projects, falsely representing the individual contributions of the collaborating partners.

**Frequently Asked Questions**

"Do I have to pass all the components of the assessment to pass the unit?"

Yes, you must demonstrate competency in, i.e. pass, each assessment task to pass this unit.

*Why are there so many pieces of continuous assessment?*

One of the aims of this unit is to develop your professional skills. This takes practice: more, relatively smaller, assessments allow you to practise and receive feedback on your writing and learning. It also prevents “cramming” and encourages good time management skills.
# Timetable

Lectures & Tutorials are held 10am to 1pm Tuesdays, in Room 400.219

<table>
<thead>
<tr>
<th>Week # Beginning</th>
<th>Lecture Topic</th>
<th>Tutorial</th>
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<tbody>
<tr>
<td>1 27 Feb</td>
<td>Revision quiz (not assessed)</td>
<td>Revision Quiz Tutorial</td>
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<tr>
<td>2 5 Mar</td>
<td>DNA structure &amp; Replication</td>
<td>How to write a Summary</td>
</tr>
<tr>
<td>3 12 Mar</td>
<td>Transcription/ Translation</td>
<td>Planning a debate</td>
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<tr>
<td>4 19 Mar</td>
<td>Gene Expression in Prokaryotes &amp; Eukaryotes</td>
<td>Summary interim session</td>
</tr>
<tr>
<td>5 26 Mar</td>
<td>Nucleic Acid Hybridization: Principles &amp; Applications</td>
<td>Module Test for wks 2-4*</td>
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<tr>
<td>6 2 Apr</td>
<td>The Spectrum of Gene Variation (CM)</td>
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<tr>
<td>7 9 April</td>
<td>Tuition-free Week</td>
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<tr>
<td>8 16 Apr</td>
<td>DNA Extraction/ DNA Mutagenesis</td>
<td>Feedback on Summary</td>
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<tr>
<td>9 23 Apr</td>
<td>Analysing DNA &amp; Gene Structure, Variation &amp; Expression</td>
<td>Module Test for wks 5-8*</td>
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<tr>
<td>10 30 Apr</td>
<td>Genes in Pedigrees</td>
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<tr>
<td>11 7 May</td>
<td>Organization of the Human Genome</td>
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<tr>
<td>12 14 May</td>
<td>Cancer Genetics</td>
<td>Debate</td>
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<tr>
<td>13 21 May</td>
<td>Module Test for wks 9-12*</td>
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<tr>
<td>14 28 May</td>
<td>Study Week</td>
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<tr>
<td>15-16 4 to 15 June</td>
<td>Exam Weeks</td>
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* Please note that the Module Tests will start at 10am, and will be followed by the lecture.

**Guest Lecturer:**
CM: Dr Cyril Mamotte