# BIOL981: Molecular Cell Biology

## Subject Outline
Autumn, 2016  
On-Campus  
Wollongong

## Subject Information
Credit Points: 12  
Pre-requisite(s): SCIE911, BIOL815, BIOL813, SCIE913, SCIE914 for students enrolled in one of the following specialisations for the Master of Science; Biotechnology, Chemistry, Environmental Biology, Medicinal Chemistry.  
Co-requisite(s): Nil  
Restrictions: Available only to students enrolled in Master of Science (Biotechnology)  
Contact Hours: 2 hrs Lecture, 4 hrs Tutorial/Practical p.w.

## Subject Contacts

### Subject Coordinator/Lecturer
<table>
<thead>
<tr>
<th>Name:</th>
<th>Prof Marie Ranson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Building 32, Room 307</td>
</tr>
<tr>
<td>Telephone:</td>
<td>61 2 4221 3291</td>
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<tr>
<td>Email:</td>
<td><a href="mailto:mranson@uow.edu.au">mranson@uow.edu.au</a></td>
</tr>
<tr>
<td>Consultation mode and times:</td>
<td>Email for appointment</td>
</tr>
</tbody>
</table>

### Lecturer/Demonstrator/Tutor
<table>
<thead>
<tr>
<th>Name:</th>
<th>Dr Lezanne Ooi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Building 32, Room 231</td>
</tr>
<tr>
<td>Telephone:</td>
<td>61 2 4221 5865</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:lezanne_ooi@uow.edu.au">lezanne_ooi@uow.edu.au</a></td>
</tr>
<tr>
<td>Consultation mode and times:</td>
<td>Email for appointment</td>
</tr>
</tbody>
</table>

### Lecturer/Demonstrator/Tutor
<table>
<thead>
<tr>
<th>Name:</th>
<th>Prof Mark Wilson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Building 32, Room 304</td>
</tr>
<tr>
<td>Telephone:</td>
<td>61 2 4221 4534</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:mark_wilson@uow.edu.au">mark_wilson@uow.edu.au</a></td>
</tr>
<tr>
<td>Consultation mode and times:</td>
<td>Email for appointment</td>
</tr>
</tbody>
</table>
Student Support and Advice
For general enquiries please contact the StudentHub 41:
Location: 41.138B
Telephone: 61 2 4221 3492
Email: smah-students@uow.edu.au

Student Consultation and Communication
University staff receive many emails each day. In order to enable them to respond to your emails appropriately and in a timely fashion, students are asked to observe basic requirements of professional communication:

Consider what the communication is about
- Is your question addressed elsewhere (e.g. in the subject outline or, on the eLearning site)?
- Is it something that is better discussed in person or by telephone? This may be the case if your query requires a lengthy response or a dialogue in order to address. If so, see consultation times above and/or schedule an appointment.
- Are you addressing your request to the most appropriate person?

Specific email subject title to enable easy identification of issue
- Identify the subject code of the subject you are enquiring about (as staff may be involved in more than one subject) put this in the email subject heading. Add a brief, specific query reference after the subject code where appropriate.

Professional courtesy
- Address the staff member appropriately by name (and formal title if you do not yet know them).
- Use full words (avoid ‘text-speak’ abbreviations), correct grammar and correct spelling.
- Be respectful and courteous.
- Allow 3 – 4 working days for a response before following up. If the matter is legitimately urgent, you may wish to try telephoning the staff member (and leaving a voicemail message if necessary) or inquiring at the School Office.
- Please ensure that you include your full name and student number and identify your practical class or tutorial group in your email so that staff know who they are communicating with and can follow-up personally where appropriate.
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Section A: General Information

Subject Learning Outcomes

On completion of this subject, students should be able to:

1. Demonstrate an understanding of the fundamental importance of cellular structure and function to all life forms

2. Demonstrate a broad understanding of many specific aspects of cell biology, including cell and tissue structure, protein sorting mechanisms, secretion, membrane transport, energetics, signal transduction, apoptosis, the cytoskeleton, the cell cycle and cancer

3. Demonstrate proficiency in a range of cell biological techniques required for:
   I. cell isolation and analysis
   II. growth of various cell types in aseptic culture
   III. observation and manipulation of cellular functions
   IV. the purification of cellular organelles

Subject Description

This subject covers many specific aspects of cell biology, including cell and tissue structure, protein sorting mechanisms, secretion, membrane transport, energetics, signal transduction, apoptosis, cellular and molecular genetics of development, the cell cycle and cancer. In addition, focused lab-based practicals are offered which will provide an understanding of the techniques used for studying cell biology. These include: cell and organelle isolation and analysis, growth of various cell types in aseptic culture, observation and manipulation of cellular functions and cell surface labelling and protein blotting. Lastly, students undertake a detailed literature review on a molecular cell biology cutting edge topic (equivalent to approx. 4 hours/week study) to be presented in written and oral form

eLearning Space

This subject has materials and activities available via eLearning. To access eLearning you must have a UOW user account name and password, and be enrolled in the subject. eLearning is accessed via SOLS (student online services). Log on to SOLS and then click on the eLearning link in the menu column. For information regarding the eLearning spaces please use the following link:

http://uowblogs.com/moodlelab/files/2013/05/Moodle_StudentGuide-1petpo7.pdf

Lecture, Tutorial, Laboratory Times

All timetable information is subject to variation. Check latest timetabling information on the ‘Current Student’ webpage on UOW website or log into SOLS to view your personal timetable prior to attending classes.


Timetable information can be accessed from

Key University Dates can be accessed from

Readings, References and Materials

Textbooks

The following text(s) will need to be purchased by students enrolled in this class.

Cell and Molecular Biology – Concepts and Experiments. 7th ed. Karp, G. Wiley

Prescribed Readings (includes eReadings)

Nil
Materials
UOW Approved Calculator
Laboratory Coat

Recommended Readings
The following references complement the prescribed readings and textbooks:


Recommended readings are not intended as an exhaustive list, students should use the Library catalogue and databases to locate additional resources.

Recent Changes to this Subject
i. Nil

Ethical Objection to the Use of Animal and Animal Products
In order to achieve specific learning objectives, the use of animals, animal tissues, and or animal-derived products (such as sera) is inherent and unavoidable. Students with conscientious objections to this use should not enrol in this subject.

Students who intend to avoid a particular learning activity on the basis of conscientious objection should notify the subject coordinator in writing as soon as possible and not later than the end of Week 1 of the session. Students who do not participate in a particular learning activity are required to complete an alternative exercise (a CD-ROM is available) or attend the practical and "observe". The material involved is examinable and the prac must be written up and completed in your workbook. For further information, refer to http://www.uow.edu.au/about/policy/UOW058708.html

Laboratory Safety Guidelines
The rules below are general rules that are required in laboratories.

- Before commencing your project you are to ensure that you understand specific procedures for the laboratory in which you work.
- You will need to fill out a risk assessment form before commencing any experiments (confer with your laboratory supervisor).
- Never use any equipment or attempt any experiment without checking the safety implications with your laboratory supervisor or experienced delegated laboratory worker.
- Undergraduate students are not permitted to work after hours unless there is appropriate approval and supervision.
List of Topics Covered
The following are examples of the topics to be covered in this course. This is not an exhaustive list and will be subject to change.

Cells and their Environment
Cell Membranes
Secretion and Endocytosis
Protein sorting mechanisms
Macromolecular traffic
Intracellular protein quality control
Mitochondria and Neurons
Stem Cells
Signal Transduction
Apoptosis
The Cytoskeleton and Cell Motility
The Cell Cycle
Cancer

A Timetable of Topics will be available from the eLearning site in week 1 of session.
Section B: Assessment

Assessment Summary

<table>
<thead>
<tr>
<th>Assessment Item</th>
<th>Form of Assessment</th>
<th>Due Date</th>
<th>Return/Feedback Due Date</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment 1</td>
<td>Mid-session quiz</td>
<td>TBD</td>
<td>Within 21 days of due date</td>
<td>7.5%</td>
</tr>
<tr>
<td>Assessment 2</td>
<td>Student Lab Book 1</td>
<td>TBD</td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>Assessment 3</td>
<td>Scientific Report</td>
<td>TBD</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td>Assessment 4</td>
<td>Student Lab Book 2</td>
<td>TBD</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Assessment 5</td>
<td>Practical Exam</td>
<td>TBD</td>
<td></td>
<td>12.5%</td>
</tr>
<tr>
<td>Assessment 6</td>
<td>Final Theory Exam</td>
<td>During Exam Period</td>
<td></td>
<td>25%</td>
</tr>
<tr>
<td>Assessment 7</td>
<td>Literature review and seminar</td>
<td>To be discussed with coordinator</td>
<td></td>
<td>30%</td>
</tr>
<tr>
<td><strong>Total Marks</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Details of Assessment Tasks

Assessment tasks will be marked using explicit criteria that will be provided to students prior to submission.

**Assessment 1**
- **Mid-session quiz**
- **Due date**: TBD
- **Weighting**: 7.5%
- **Submission**: Exam papers and answers must be submitted at the conclusion of the exam.
- **Type of Collaboration**: Individual Assessment
- **Length**: 1 hour
- **Details**: 1 hr quiz. Short answer questions based on the first six weeks of lectures.
- **Style and format**: Exam - short answer questions
- **Subject Learning Outcomes**: 1, 2
- **Marking Criteria**: The marking criteria will be made available on your eLearning site by week 1 of session.

**Assessment 2**
- **Student Lab Book 1**
- **Due date**: TBD
- **Weighting**: 6%
- **Submission**: Submit a hardcopy of your assessment to the TO in Bldg 43
- **Type of Collaboration**: Individual Assessment
- **Length**: See details below
- **Details**: Based on all practicals from the first few weeks. Details of which practical results to be included on this assessment will be made available on your eLearning site by week 1 of session.

The Subject Manual contains background information and instructions for all practical classes, together with tables to be completed and questions to be answered. Results from practicals must be recorded in a small dedicated exercise book ("Laboratory Notebook") for assessment.

Prior to ALL practical classes students should read the manual and complete a flow diagram in their laboratory notebooks that clearly demonstrates the steps in the experiment(s) to be used in the practical class that day.

This flow diagram will be checked and marked by demonstrators at the start of each practical and marks will be deducted from the overall laboratory grade.
notebook mark if it is not completed. Students are required to complete the relevant tables and answer questions posed for all practicals. This may be done initially in the subject manual itself during the practical class; however, these tables and answers must then be copied NEATLY into the laboratory notebook.

### Style and format
- **Laboratory notebook**

### Subject Learning Outcomes
- 3

### Marking Criteria
- The marking criteria will be made available on your eLearning site by week 1 of session.

### Assessment 3
- **Scientific Report**
- **Due date**: TBD
- **Weighting**: 12%
- **Submission**: Electronic
- **Type of Collaboration**: Individual Assessment
- **Length**: 12 pages (including figures but excluding references and appendices) - text in excess of this length will be ignored.
- **Details**: You are required to write a complete scientific report for the practicals performed in weeks 8 and 9 titled “Protein Aggregation”.

#### Style and format
- Report: Per the journal "The Journal of Neuroscience". A sample article is available with the Technical Officer (Stephen Poon) or can be viewed online – http://www.jneurosci.org/
- Print one column only on each page. Use 12 point font size, Times New Roman font and double space between lines (except for Figure Legends and References). All margins set at 2 cm.

### Subject Learning Outcomes
- 2, 3

### Marking Criteria
- The marking criteria will be made available on your eLearning site by week 1 of session.

### Assessment 4
- **Student Lab Book 2**
- **Due date**: TBD
- **Weighting**: 7%
- **Submission**: Submit a hardcopy of your assessment to the TO in Bldg 43
- **Type of Collaboration**: Individual Assessment
- **Length**: See details below

#### Details
- Based on all practicals from remaining practicals OTHER than the ‘Protein Aggregation’ practicals.
- The Subject Manual contains background information and instructions for all practical classes, together with tables to be completed and questions to be answered. The protein aggregation practical will be assessed via Scientific Writing Report. Results from practicals must be recorded in a small dedicated exercise book ("Laboratory Notebook") and will be assessed separately.
- Prior to ALL practical classes students should read the manual and complete a flow diagram in their laboratory notebooks that clearly demonstrates the steps in the experiment(s) to be used in the practical class that day.
- This flow diagram will be checked and marked by demonstrators at the start of each practical and marks will be deducted from the overall laboratory
Students are required to complete the relevant tables and answer questions posed for all practicals. This may be done initially in the subject manual itself during the practical class; however, these tables and answers must then be copied NEATLY into the laboratory notebook.

<table>
<thead>
<tr>
<th>Style and format</th>
<th>Laboratory notebook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Learning Outcomes</td>
<td>3</td>
</tr>
<tr>
<td>Marking Criteria</td>
<td>The marking criteria will be made available on your eLearning site by week 1 of session.</td>
</tr>
</tbody>
</table>

### Assessment 5: Practical Exam
- **Due date**: TBD
- **Weighting**: 12.5%
- **Submission**: Exam papers and answers must be submitted at the conclusion of the exam.
- **Type of Collaboration**: Individual Assessment
- **Length**: 2 hours
- **Details**: 2 hr exam. Multipart short answer questions that may include theory, graphing and/or calculations associated with any of the practicals performed.
- **Style and format**: Exam - short answer questions
- **Subject Learning Outcomes**: 2, 3
- **Marking Criteria**: The marking criteria will be made available on your eLearning site by week 1 of session.

### Assessment 6: Final Theory Exam
- **Due date**: During Exam Period
- **Weighting**: 25%
- **Submission**: Exam papers and answers must be submitted at the conclusion of the exam.
- **Type of Collaboration**: Individual Assessment
- **Length**: 3 hours
- **Details**: 3 hr exam including short answer and essay questions
- **Style and format**: Exam - short answer questions and essay questions
- **Subject Learning Outcomes**: 1, 2
- **Marking Criteria**: The marking criteria will be made available on your eLearning site by week 1 of session.

### Assessment 7: Literature review and seminar
- **Due date**: To be discussed with coordinator
- **Weighting**: 30%
- **Submission**: N/A
- **Type of Collaboration**: Individual Assessment
- **Length**: To be discussed with coordinator
- **Details**: To be discussed with coordinator
- **Style and format**: To be discussed with coordinator
- **Subject Learning Outcomes**: 1, 2
- **Marking Criteria**: The marking criteria will be made available on your eLearning site by week 1 of session.
Minimum Requirements for a Pass in this Subject

To receive a clear pass in this subject a total mark of 50% or more must be achieved. In addition, failure to meet any of the minimum performance requirements is grounds for awarding a Technical Fail (TF) in the subject, even where total marks accumulated are greater than 50%.

The minimum performance requirements for this subject are:

- Obtain a total grade of 50% or higher on the final examination

Minimum Student Attendance and Participation

It is expected that students will allocate 16 hours per week to this subject, including any required class attendance, completion of prescribed readings and assessment tasks.

Student attendance at tutorials, practicals, seminars and/or simulations is compulsory and students must attend at least 100% of classes. Absences will require the submission of an application for Academic Consideration via SOLS and the presentation of suitable documentation, for example a Medical Certificate, to Student Central as soon as practical. For further details about applying for academic consideration visit the Student Central webpage: http://www.uow.edu.au/student/central/academicconsideration/index.html

Scaling

Scaling may occur in this subject at the end of session by the Unit Assessment Committee and/or Faculty Assessment Committee (FAC). Marks will only be scaled to ensure fairness/parity of marking across groups of students. Scaling will not affect any individual student’s rank order within their cohort. For more information refer to Assessment Guidelines – Scaling: http://www.uow.edu.au/about/teaching/UOW039331.html

Late Submission

Late submission of an assessment task without an approved extension of the deadline is not acceptable. If you are unable to submit an assessment due to extenuating circumstances (e.g. medical grounds or compassionate grounds), you can make an application of academic consideration. Not all circumstances qualify for academic consideration. For further details about applying for academic consideration visit the Student Central webpage: http://www.uow.edu.au/student/central/academicconsideration/index.html

Late Submission Penalty

Late submission of an assessment task without an approved extension of the deadline is not acceptable. Marks will be deducted for late submission at the rate of 10% of the total possible marks for that particular assessment task per day. This means that if a piece of work is marked out of 100, then the late penalty will be 10 marks per day (10% of 100 possible marks per day). The formula for calculating the late penalty is the total possible marks x 0.10 x number of days late. For the purposes of this policy a weekend (Saturday and Sunday) will be regarded as two days.

No marks will be awarded for work submitted after the assessment has been returned to the students.

System of Referencing Used for Written Work

The Author-Date (Harvard) referencing system should, unless otherwise specified for a particular assessment (check Details of Assessment Tasks), be utilised. A summary of the Harvard system can be accessed on the Library website at: http://public01.library.uow.edu.au/refcite/style-guides/html/

Use of Internet Sources

Students are able to use the Internet to access the most current information on relevant topics and information. Internet sources should only be used after careful critical analysis of the currency of the information, the role and standing of the sponsoring institution, reputation and credentials of the author, the clarity of the information and the extent to which the information can be supported or ratified by other authoritative sources.
Plagiarism
The full policy on Academic Integrity and Plagiarism is found in the Policy Directory on the UOW website.

“The University’s Academic Integrity and Plagiarism Policy, Faculty Handbooks and subject guides clearly set out the University’s expectation that students submit only their own original work for assessment and avoid plagiarising the work of others or cheating. Re-using any of your own work (either in part or in full) which you have submitted previously for assessment is not permitted without appropriate acknowledgement. Plagiarism can be detected and has led to students being expelled from the University.

The use by students of any website that provides access to essays or other assessment items (sometimes marketed as ‘resources’), is extremely unwise. Students who provide an assessment item (or provide access to an assessment item) to others, either directly or indirectly (for example by uploading an assessment item to a website) are considered by the university to be intentionally or recklessly helping other students to cheat. This is considered academic misconduct and students place themselves at risk of being expelled from the University.”

Submission of Assessments
Refer to the submission requirements under the details of the individual assessments. Students should ensure that they receive a receipt acknowledging submission. Students will be required to produce this in the event that an assessment task is considered to be lost. Students are also expected to keep a copy of all their submitted assessments in the event that re-submission is required.

Assessment Return
Students will be notified when they can collect or view their marked assessment. In accordance with University Policy marked assessments will usually only be held for 21 days after the declaration of marks for that assessment.
Section C: General Advice

Students should refer to the Faculty of Science, Medicine and Health website for information on policies, learning and support services and other general advice.

University Policies
Students should be familiar with the following University policies:

a. Code of Practice – Teaching and Assessment

b. Student Charter

c. Academic Integrity and Plagiarism Policy

d. Student Academic Consideration Policy

e. Course Progress Policy

f. Graduate Qualities Policy

g. Academic Complaints Policy (Coursework and Honours Students)

h. Policy and Guidelines on Non-Discriminatory Language Practice and Presentation

i. Workplace Health and Safety, where relevant

j. Intellectual Property Policy

k. Policy on Ethical Objection by Students to the Use of Animal and Animal Products in Coursework Subjects, where relevant

l. Animal Research Guidelines, where relevant

m. Student Conduct Rules and accompanying Procedures or Research Misconduct Policy for research students

Student Support Services and Facilities
Students can access information on student support services and facilities at the following link. This includes information on “Academic Support”, “Starting at University, “Help at University” as well as information and support on “Career’s and Jobs”. http://www.uow.edu.au/student/services/index.html

Student Etiquette
Guidelines on the use of email to contact teaching staff, mobile phone use in class and information on the university guide to eLearning ‘Netiquette’ can be found at http://www.uow.edu.au/student/elearning/netiquette/index.html
<table>
<thead>
<tr>
<th>Version Control</th>
<th>Release Date</th>
<th>Author/Reviewer</th>
<th>Approved By</th>
<th>Amendment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20160120</td>
<td>Prof Marie Ranson – Subject Coordinator</td>
<td>Sonia Losinno – ADE nominee</td>
<td>FINAL BIOL981 Autumn 2016 Subject Outline</td>
</tr>
</tbody>
</table>