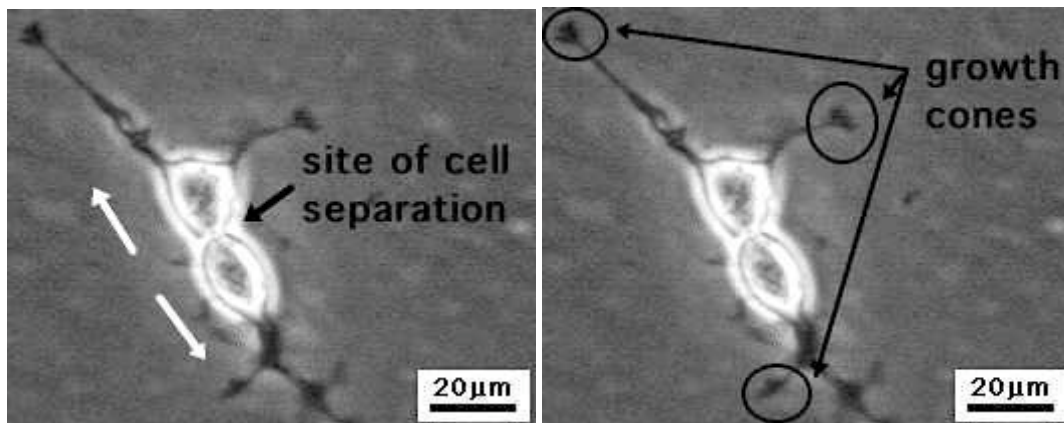




THE UNIVERSITY OF  
NEW SOUTH WALES

School of Medical Sciences

# ANAT3231 CELL BIOLOGY



Two cells (neurons) which have recently divided.

## Session 1, 2009

## Course Overview

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Dr Mark Hill  
(course coordinator)

From the course coordinator...

**Welcome** to Cell Biology in 2009 and thank you for choosing this exciting topic! Cell Biology and its associated methodologies are now found at the core of basic scientific investigations and current medical research. Subsequently skills and knowledge from this current course will be a great advantage in your own future career. Students who have completed this course have enjoyed both the pace, content and structure of the course. I am also continually assessing their feedback in the updating, design and presentation of the course.

**Notes concerning 2009.** There were several changes to the course commencing last year due to UNSW semesters change from a 14 week to a 12 week structure. Secondly, the current timetable means some reorganised lecture slots due to clashes with my Medical teaching. I also know that there some student have timetable clashes with other courses that we have not yet been able to resolve.

**UNSW Cell Biology and Wiki** new online resources and assessment procedures I have developed to aid your own group and independent learning commencing this year. Some laboratory time will be spent giving support in preparation of group and individual online assessment.

In **Lectures and Labs** I provide regular handouts or online support for the content and clearly identify any examinable material. A key component of course structure is the revision final lecture, an opportunity to review course material and ask questions about difficult concepts. As part of the course I also encourage you to develop the general scientific skills of critical thinking, analysis and scientific writing. These are important life skills applicable and required for any future (scientific) career.

This **handout** contains information designed to help you get started and plan for this semester, please take the time to read through it and contact me if you have any difficulties. Also feel free to contact me with questions and course feedback by email at any time.

*Dr Mark Hill* (January 2009)

## **COURSE OUTLINE CONTENT DETAILS**

### **Course staff**

- Dr Mark Hill
- Office: room G20 ground floor, Wallace Wurth Building
- Email: m.hill@unsw.edu.au

### **Student Contact**

- University policy concerning student contact is: "When a student is enrolled into University of New South Wales, he or she will be automatically issued with a University email account. The School will use that email account as the official electronic channel to communicate with each student."
- Appointments should be made initially by email to Dr Mark Hill or through the SOMS office (room MG14).
- Appointments times during 2009 semester 1 each Wednesday from 11am to 1pm, or at other times by arrangement.

### **School of Medical Sciences Student Advisor**

- The current SOMS advisor is Carmen Robinson (room MG14)
  - Telephone: (+612) 9385 2464
  - Fax: (+612) 9385 2866
  - Email: c.robinson@unsw.edu.au

### **Course information**

- 6 Units of credit, Science/Anatomy program
- Prerequisite: ANAT2200 or ANAT2241

### **Course structure**

- Two lectures and a single tutorial/laboratory per week.
  - Lectures: Tue 1pm Biomed F, Wed 10am Biomed E
  - Laboratory: Thu 11am - 1pm Wallace Wurth 106/108 (K-C27-106)

### **Grievance procedure**

- Problems or a grievance with the course, you should first attempt to resolve it with the course organizer (Dr Mark Hill, room G20). If the grievance cannot be resolved in this way, it should be directed to the department's grievance officer (Dr Priti Pandey).

### **Course Aims**

- To present the current theories and applications of cell biology.
- To describe internal and external cellular structures.
- To examine dynamic changes within the cell.
- To cover emerging cell biology research technologies.

## Assessment

- There will be three parts to the course assessment.
  1. Group Project – An online assignment from a selection of topics. 20%
  2. Independent Learning - Assessment throughout session. 20%
  3. Theory - A written test held during the examination period. 60%
- **Assessment Design** has been structured to develop and examine the following graduate attributes and specific learning skills:
  - Student independent learning/research abilities
  - Student scientific writing and referencing skills
  - Student teamwork in small groups
  - Student group work contribution
  - Student ability to plan time and meet assessment deadlines
  - Student acquired knowledge from lecture/lab presentations
  - Student application of knowledge to problem solving
- For more information see also UNSW Guidelines on Learning
  - <http://www.guidelinesonlearning.unsw.edu.au/guidelinesHome.cfm>
- **Student learning Outcomes** By the end of this course you will have learned the current understanding of cell structure and function and how this is dynamically organized. You will also understand the major methods used to study cells and their application to medical research. This information can then be integrated with other program subjects to give a cellular basis for Anatomy. Importantly the teaching methods and content are designed to encourage your own self-motivated scientific enquiry.
- **Examiner** The course organizer (Dr Mark Hill) will be the examiner. The course assessor is Prof Edna Hardeman.
- **Group Project** an online project prepared by groups of 4 students throughout semester. The project will be assessed by student peers and by the course organizer in week 11 of the semester.
- **Individual Assessment** (independent learning) there will be 2 main parts to the independent learning assessment. The first is an online presentation of a protein “snapshot” or method associated with your group project. The other half of this assessment will be brief questions based upon lecture and laboratory content given in the laboratory time and submitted by the end of laboratory time throughout semester.
- **Theory examination** will be an exam within the session 1 exam period and will conform to University examination guidelines. The theory exam is a 3 hour short answer essay format, assessing student understanding and comprehension of cell biology. Questions are based on lecture material and supporting laboratory content. Sample questions will be provided online and

during the final revision lecture.

- Students absent through illness or misadventure should immediately contact UNSW Student Central. For more information see UNSW A-Z Guide Special Consideration.

<https://my.unsw.edu.au/student/atoz/SpecialConsideration.html>

<https://my.unsw.edu.au/student/atoz/UNSWStudentCentral.html>

- **Supplementary examinations** will only be offered if the student is unable to attend the final examination for medical or misadventure reasons.
- **Group and Individual Project Dates** The assessment closing dates are: Wednesday week 11 online group project, Wednesday week 10 individual project. Submissions received after the closing date will be penalized 5% for each day after the closing date.

### Group Online Project

Group projects will be linked from the ANAT3231 Projects 2009 Wiki page located at:

[http://php.med.unsw.edu.au/cellbiology/index.php?title=ANAT3231\\_Projects\\_2009](http://php.med.unsw.edu.au/cellbiology/index.php?title=ANAT3231_Projects_2009)

Available group project tiles are listed on page 12 of this handout. Your own group wiki project will be open to editing by your own group members and the course coordinator at all times. I would ask students from other groups not to edit other projects until week 7. The following notes should be used as a general guideline for your online project.

1. Firstly do a comprehensive literature search and as you read, jot down potential headings for your wiki and points where you think that you need to include more information, explanation or detail to explain it fully to a peer. This “troublesome” spots are probably concepts that you and your group colleagues find more difficult than others, or which contain “troublesome” (i.e. new or complex) language (or terminology). The best wikis are those that explain the content better.
2. You should give more than an overview of your topic and more than what is covered in lectures. Your wiki should complement the structured learning activities by expanding on some relevant or interesting area (using sub-headings) and / or by describing / explaining some troublesome content.
3. Decide on your wiki headings, divide the work between group colleagues and begin to write 1500 words on your chosen topic. Instructions on how to use the wiki software will be provided in the laboratory time and online. Direct the level of the wiki to a readership of your peers in the science program.
4. Use innovative figures / tables / diagrams / explanations to illustrate the content with the aim of increasing the understanding of your peers, the readers.

5. During week 3-6 you should monitor the edits made by your group peers to your wiki. You should also be involved in the “talk” discussions that may follow editing of your wiki where someone makes further comments or explanations about why they made their edits.

6. During week 7 you should also review and edit an individual project page entry developed by a peer on another topic in the course (and as allocated to you).

7. At end of week 10 you need to review all the edits made to your wiki and reflect on the changes made by your peers. Write a Group Reflection section (up to 500 words) that includes a specific mention of the wiki writing and editing process plus a more generic reflection on the project process in terms of what you learnt overall. Download (e.g. by copying and pasting) all of the edits made in the exposed wiki in the edit time period. Attach this to your report as supplementary material. You should also reflect on the process of reviewing a peer’s wiki.

8. Submit your final wiki version (‘final’ meaning the version on the wiki site on Wednesday week 11).

9. During week 11 laboratory peers from other groups will also assess your final wiki project.

The course coordinator has identified and is aware of any Wikipedia, OMIM, Medline plus and other wiki entries available on these topics and will readily identify students who plagiarise directly from them. See the material available in the course handout on plagiarisms for information on definitions and penalties.

Weeks 2-3 Begin research on your topic and headings, allocate specific sections to group members.

Weeks 3-6 Write and format the wiki using the defined citation and reference listing

Week 7 Wikis go open to editing.

Week 9 Monitor the edits as appear during this week; writing notes and reflecting on the suggestions and reflecting on how this may have improved. Edit the wiki of a peer’s topic as allocated.

Week 11 submit the final wiki version by the Wednesday deadline.

#### Group Assessment criteria

- The key points relating to the topic that your group was allocated are clearly described.
- The choice of content, headings and sub-headings, diagrams, tables, graphs show a good understanding of the topic area.
- Content is correctly cited and referenced.
- The wiki has an element of teaching at a peer level using the student’s own innovative diagrams, tables or figures and/or using interesting examples or explanations.
- Evidence of significant research relating to basic and applied sciences that goes beyond the formal teaching activities.
- Relates the topics and content of the Wiki entry to learning aims of cell biology.

- Clearly reflects on editing/feedback from group peers and articulates how the Wiki could be improved (or not) based on peer comments/feedback. Demonstrates an ability to review own work when criticised in an open edited wiki format. Reflects on what was learned from the process of editing a peer's wiki.
- Evaluates own performance and that of group peers to give a rounded summary of this wiki process in terms of group effort and achievement.
- The content of the wiki should demonstrate to the reader that your group has researched adequately on this topic and covered the key areas necessary to inform your peers in their learning.
- Develops and edits the wiki entries in accordance with the wikipedia guidelines.

### **Individual Online Project**

Individual projects will be linked from the ANAT3231 Projects 2009 Wiki page located at:

[http://php.med.unsw.edu.au/cellbiology/index.php?title=ANAT3231\\_Projects\\_2009](http://php.med.unsw.edu.au/cellbiology/index.php?title=ANAT3231_Projects_2009)

The individual project will be a specific protein component or method related too and selected from your Group Project topic. Individual projects will also link into the Group Project from which you belong and you have selected your topic. This online page will be available to be edited by others until final peer assessment in week 10.

### **Assessment criteria**

- The key points relating to the protein/method topic that you have selected are clearly described.
- The choice of content, headings and sub-headings, diagrams, tables, graphs show a good understanding of the topic area.
- Content is correctly cited and referenced.
- The final project should not be too lengthy, as a guideline typically 500 to a maximum of 1000 words.
- The wiki has an element of teaching at a peer level using the student's own innovative diagrams, tables or figures and/or using interesting examples or explanations.
- Evidence of significant research relating to basic and applied sciences that goes beyond the formal teaching activities.
- Relates the topics and content of the Wiki entry to the group project.
- Demonstrates an ability to review own work when criticised in an open edited wiki format. Reflects on what was learned from the process of editing a peer's wiki.
- The content of the wiki should demonstrate to the reader that you have researched adequately on this topic and covered the key areas necessary to inform your peers in their learning.
- Develops and edits the wiki entries in accordance with the wikipedia guidelines.

(Based on text from medicine program project wikis)

## Academic honesty and plagiarism

Please Read - Plagiarism & Academic Integrity [www.lc.unsw.edu.au/plagiarism](http://www.lc.unsw.edu.au/plagiarism)

### What is Plagiarism?

Plagiarism is the presentation of the thoughts or work of another as one's own.\*  
Examples include:

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism. Knowingly permitting your work to be copied by another student may also be considered to be plagiarism. Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does *not* amount to plagiarism. The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via: [www.lc.unsw.edu.au/plagiarism](http://www.lc.unsw.edu.au/plagiarism)

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

\* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle † Adapted with kind permission from the University of Melbourne.

## Resources for Students

### • Textbooks

- **Essential Cell Biology** (2nd ed.) Alberts, etal. 2003, is recommended for this course and page references are given in lectures. Additional online textbooks from NCBI Bookshelf can also be used, consult the course organizer.
- <http://cellbiology.med.unsw.edu.au/units/science/textbooks.htm>

### • UNSW Cell Biology Online

- Additional course information and links can be found from the course webpage and wiki sites. Lectures slides, handouts and course materials are available for current students from ANAT3231 and are for educational use only.

- Cell Biology Wiki  
[http://php.med.unsw.edu.au/cellbiology/index.php?title=Main\\_Page](http://php.med.unsw.edu.au/cellbiology/index.php?title=Main_Page)  
<http://cellbiology.med.unsw.edu.au>
- Cell Biology Website  
<http://cellbiology.med.unsw.edu.au>  
2008 ANAT3231 lecture pages  
<http://cellbiology.med.unsw.edu.au/units/science/lectures.htm>
- Online Textbook information  
<http://cellbiology.med.unsw.edu.au/units/science/textbooks.htm>
- Cell Biology Lab  
<http://cellbiology.med.unsw.edu.au/cbl.htm>
- School of Medical Sciences (SOMS)  
<http://medsciences.med.unsw.edu.au/medsciences.nsf>
- SOMS Occupational Health and Safety (OHS)  
<http://medsciences.med.unsw.edu.au/somsweb.nsf/page/OHS>
- UNSW Unimail Information  
<http://www.disconnect.unsw.edu.au/student/zhome.htm>
- **Lecture Recordings** Available from both **UNSW Cell Biology** and **Lectopia**, online sound recording system making UNSW Lectures available in several formats (including Podcast).  
  
<http://ilecture.edtec.unsw.edu.au/ilectures/ilectures.lasso?ut=90>
- **Laboratory Structure** It is important to be at this location on time, as some classes will then proceed to other locations on campus.

## **Continual course improvement**

- Periodically student evaluative feedback on the course is gathered, using among other means, UNSW's Course and Teaching Evaluation and Improvement (CATEI) Process. Student feedback is taken seriously, and continual improvements are made to the course based in part on such feedback.

## **Administrative Matters**

### **• Attendance requirements**

- Students are required to attend each lecture and laboratory unless given special permission.
- Students seeking special consideration should be able to provide medical certificates.
- Students must wear a white lab coat and closed footwear in research laboratories and comply at all times with SOMS occupational health and safety requirements (found on SOMS website).

### **• Occupational Health and Safety (OHS)**

- The University policies and expectations can be found currently at:

[http://www.hr.unsw.edu.au/ohswc/ohs/ohs\\_home.html](http://www.hr.unsw.edu.au/ohswc/ohs/ohs_home.html)

- The School of Medical Sciences (SOMS) also maintains important student specific OHS information.

<http://medicallsciences.med.unsw.edu.au/somsweb.nsf/page/OHS>

### **• Equity and Diversity**

- Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734) or on the web:

[www.equity.unsw.edu.au/disabil.html](http://www.equity.unsw.edu.au/disabil.html)

- Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements.
- Early notification is essential to enable any necessary adjustments to be made

**Class Timetable S1, 2009 (draft)**

<b>Week</b>	<b>Date</b>	<b>Lecture 1 Tuesday 1-2 pm Biomed F</b>	<b>Lecture 2 Wednesday 10-11am Biomed E</b>	<b>Laboratory * Thursday 11am - 1pm Wallace Wurth 106/108</b>
1	09 Mar	Cell Biology Introduction	Cells Eukaryotes and Prokaryotes	Introduction to Lab
2	16 Mar	Cell Membranes and Compartments	Cell Nucleus	Microscopy Methods
3	23 Mar	Protein Export	Protein Import	Preparation/Fixation
4	30 Mar	Cell Mitochondria	Cell Junctions	Immunochemistry
5	06 Apr	Cytoskeleton Introduction	Cytoskeleton 1 Intermediate Filaments	Cell Labeling Methods
	14 Apr	Mid-semester break		
6	20 Apr	Cytoskeleton 2 Microtubules	Cytoskeleton 3 Microfilaments	Cytoskeleton Exercise
7	27 Apr	Extracellular Matrix 1	Extracellular Matrix 2	Confocal Microscopy
8	04 May	Cell Division 1	Cell Division 2	Tissue Culture 1
9	11 May	Cell Death	Cell Death 2	Tissue Culture 2
10	18 May	Signal 1	Signal 2	Gene/Protein Analysis 1
11	25 May	Signal 3	Stem Cells	Gene/Protein Analysis 2
12	01 Jun	Development	Revision	Microarray Lab visit
	08 Jun	Study Week		
	12 Jun	Examinations		

\* The laboratory time will be divided between these tutorials and practical exercises on cell biology techniques and group/individual assessment items (in the second hour). In addition, laboratory visits will occur to demonstrate facilities and techniques related to cell biology research.

**Group and Individual Project Timetable** (draft, Laboratory Thursday 11am - 1pm Wallace Wurth 106/108)

The timetable below gives a general guide to how group and individual projects should be progressing throughout the semester. Note that this is a new 2009 group and individual assessment tool and may be subject to timetable and improvement changes.

**Group Topics:** The Nucleus, Mitochondria, Lysosomes, Exocytosis, Endocytosis, The Cell Cycle, Cell Division, Mitosis, Meiosis, Whole Cell Movement, Intracellular Movement, Cell Adhesion, Extracellular Matrix, Microfilament System, Microtubule System, Intermediate Filament System, Cell Death, A Signaling Pathway, Trk Receptors, Signaling at a Distance, Signaling by Contact, Golgi Apparatus, Endosomes, The Reticular Network, Cell Shape, Methods of Secretion, Membrane Structure, Specialized Neural Processes (axons/dendrites).

**Individual Topics:** Selected protein/method related to your group topic.

Week	Date	Group	Individual
1	09 Mar	Group allocation, Wiki introduction	Wiki introduction
2	16 Mar	Begin research on topic and headings	Select Individual protein/method
3	23 Mar	Write and format the wiki week 3-6	Research on topic and headings
4	30 Mar		Write and format the wiki week 4-6
5	06 Apr		
	14 Apr	Mid-session Break	
6	20 Apr		
7	27 Apr	Group Wikis go open to editing	Review and edit a peer individual project page
8	04 May	Assess edits made by other groups	Assess edits made by other peers
9	11 May		
10	18 May		Final peer assessment in week 10
11	25 May	Final peer assessment in week 11	
12	01 Jun		
	08 Jun	Study Week	
	12 Jun	Examinations	