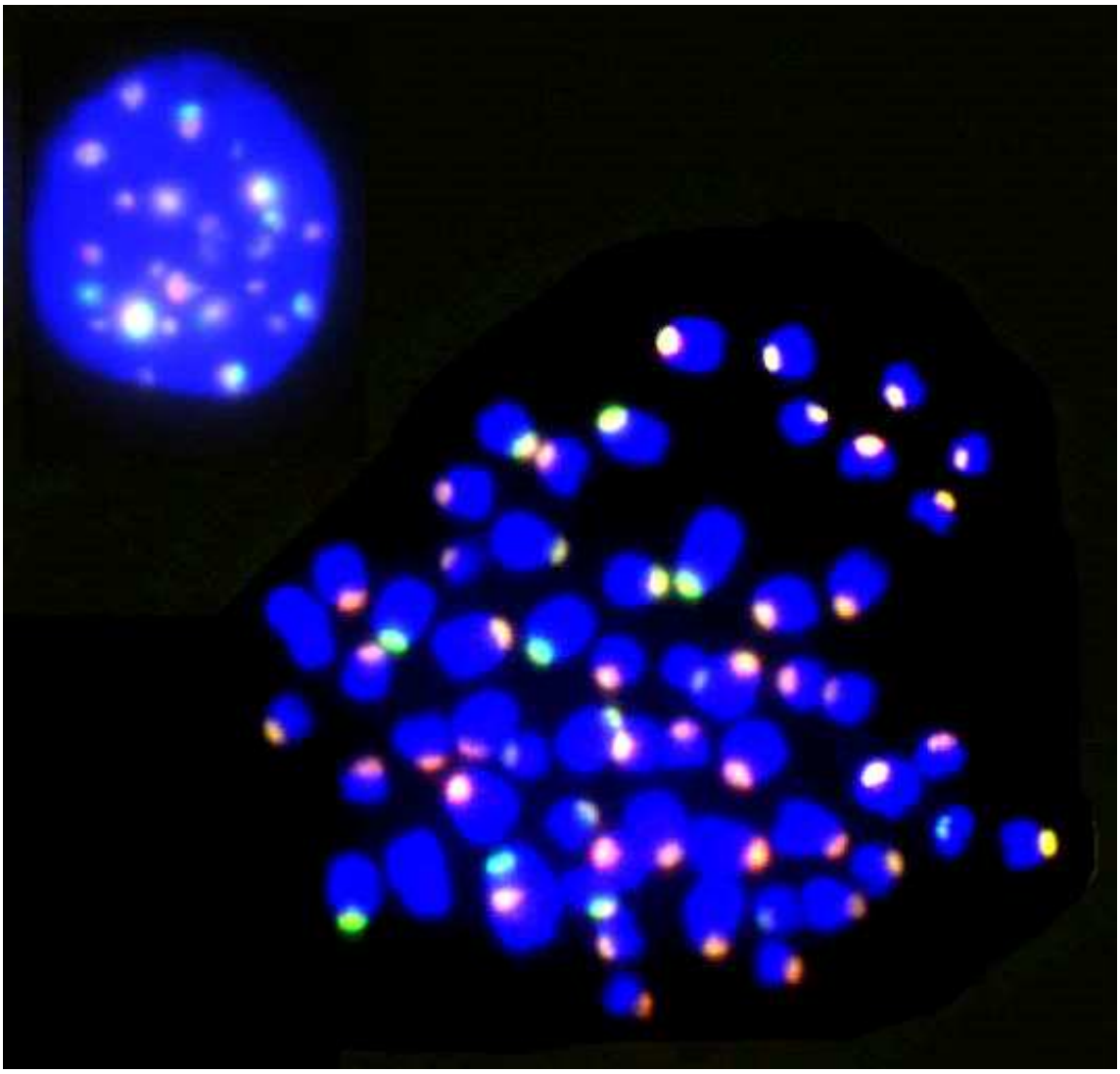
Genetics Honours

Handbook 2011



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Shuly Lim, currently a PhD student in Frank Grützner's laboratory, provided the cover photograph which shows some of her Honours results.The picture is a mitotic metaphase and an interphase nucleus of a hybrid between two bovine subspecies . *In situ* hybridisation revealed repeat sequence differences between the two sets of parental chromosomes.

Week	GENETICS HONOURS TIMETABLE 2011
7 Feb	**Commence Course** – Monday 7 February **9.30am - 10.15am School Based Safety Induction. MLS 5.01** **10.15am - 11.15am General Chemical Management** **(conducted by the University) location to be advised** First meeting with convener, 10 am, Friday 11 Feb, MLS 2.38: **Literature Review and Seminar** **Lunch 12.30 Fri 11 Feb, Breakout space MLS**
14 Feb	Thurs 17th at 9.10 - 11.00 am EndNote information BSL
21 Feb	
28 Feb	Fri Mar 4th 8.30 am Bonython Hall - Animal Ethics information (consult your supervisor)
7 Mar	
14 Mar	Submit 3 copies of the **Literature Review** by noon, Tuesday 15 March
21 Mar	**Introductory Seminar** this week
28 Mar	Second meeting with convener, 12 noon, Wednesday 30 March, MLS 2.38: **The Dossier**
4 Apr	
11 Apr	
18 Apr	
25 Apr	
2 May	
9 May	Meeting with convener 3, 12 noon, Wednesday 11 May, MLS 2.38: **The FiG**
16 May	
23 May	Submit 3 copies of the **Dossier** by noon, Friday 27 May
30 May	**FiG Topic for approval by convenor** – Monday 30 May Dossier discussion meeting this week
6 June	
13 June	
20 June	
27 June	
4 July	Resubmit Dossier if required by noon, Monday 4 July, and meet with panel
11 July	Submit 3 copies of the **Preliminary Frontiers In Genetics** by noon, Monday, 11 July
18 July	**Preliminary FiG** meeting late this week or early next week
25 July	Fourth meeting with convener, 12 noon, Wednesday 27 July, MLS 2.38: **The FiG – what now?**
1 Aug	
8 Aug	
15 Aug	Submit 3 copies of the **Written Frontiers In Genetics** by noon, Monday 22 August
22 Aug	**Oral Frontiers In Genetics** late this week or early next week
29 Aug	
5 Sept	
12 Sept	Fifth meeting with convener, 12 noon Wed 14 Sept., MLS 2.38: **Turning the Dossier into a Thesis**
19 Sept	
26 Sept	
3 Oct	
10 Oct	Cease laboratory work
17 Oct	
24 Oct	
31 Oct	
7 Nov	Submit 3 copies of **Thesis** by noon, Monday 7 November
14 Nov	**Research Seminar early** this week; Final **Thesis panel meeting** late this week or early next week

2. GENERAL INFORMATION

Welcome to Honours Genetics, a full time course of study and research carried out under the supervision of an academic staff member. Your participation in the Honours course marks a major change in the nature of your studies. You will now have the opportunity to discover new knowledge through your own research and you will have greater scope to develop your ability to think creatively and critically. You will find the Honours course challenging - the Discipline of Genetics has high expectations of its students. However, you will also find the course rewarding, not only because of the knowledge and skills you develop, but also because of the friends you make. We wish you well and we will do our utmost to provide an intellectual and physical environment that will support you to achieve your full potential.

The most important component of the Honours course is the ***research project***. When you commence the course you will already know the general nature of your project and the name of your supervisor. Any special arrangements, including the precise topic of your research project, should be finalised as soon as possible so that you can commence work efficiently. Early in the course you will write a preliminary ***literature review*** containing a critical appraisal of the literature in the area of your project and identifying significant questions, problems and opportunities. As the course progresses you will modify and develop this literature review to a stage where it is suitable for incorporation into your thesis. Details of your research work should be maintained in a ***laboratory notebook*** and summarised in a research ***dossier*** that should be updated throughout the course. This will form the basis of a ***thesis*** that will be used to assess your project. Your research will also form the basis of two seminars: an ***introductory seminar*** early in the course, in which you outline your proposed research project and obtain comments about it, and a ***research seminar*** at the end of the course, in which you present the results of your research project to members of the Discipline.

In addition to the research project, another major part of the course is designed to develop and test your critical thinking, originality and ability to integrate information and ideas. This is the ***frontiers in Genetics (FiG) proposal*** that you will develop on a topic of your choice at the cutting edge of Genetics research.

During the Honours course you are expected to read widely in the scientific literature, not just in the area of your research project and other assignments. It is impossible to keep abreast of the scientific literature in all areas of Genetics, but you should develop the habit of reading the publications critically and keeping references to papers that interest you. You are advised to choose 3 or 4 general topics of interest and build up your knowledge on these topics by discussion and reading. This will greatly assist the development of ideas for your FiG proposal.

The Discipline of Genetics seminars and journal club provide another valuable source of information and discussion***.*** You are ***required*** (there are modified arrangements for students not working in the MLS building - see below) to attend these events, as well as all the various presentations given by your fellow Honours students. There are many other seminars arranged by the School and the Discipline areas therein, and you may find these of interest and relevance; if so, you are encouraged to attend.

Consult closely with your supervisor about the special conditions and procedures that apply in the laboratory in which you carry out your research project. Remember that the role of an Honours supervisor is not so much to "tell you what to do", but rather to provide general supervision and advice and to challenge your ideas and work practices. The onus is on you to show initiative in your project and to seek help when needed from all appropriate sources including your supervisor, members of your laboratory or by *email* from a scientist anywhere in the world.

Periodically, the Honours Convener and others will use email to send you information about the course. You should check your email daily, as this will be considered the official channel of communication for Honours students about Course matters.

Some Honours students will be working in laboratories outside the Molecular Life Science Building, under the supervision of an Affiliate member of staff. External students are strongly encouraged to visit the home base of the Discipline of Genetics in the Molecular Life Science Building on a regular basis, as the Convener and other Honours students can provide support and discussion about the course. The external laboratories have their own seminars and journal clubs, so we require external students to attend only one of the weekly activities within the Discipline of Genetics: either the seminar or journal club. It is especially important that external Honours students check their email daily for information or notices of Honours student meetings. If you need assistance with the use of any facility in the Molecular Life Science Building, contact the Manager: Doug Pottrell or the Honours Convener: Jeremy Timmis and arrangements will be made. As a general principle, we require external students to maintain close contact and to become familiar with the research programs being undertaken within the Discipline of Genetics.

3. COMPONENTS OF THE COURSE

*3. i **The Literature Review - 5%** (Word limit 3000)*

This component of the course is a critical review of the literature relevant to your research project, and a summary of your proposed research. Our aim in setting such an assignment is to assist you, early in the course, to plan your research project and become familiar with the background to it. The literature review is a key component of the learning process and aids in the preparation of your research. It should also help with your scientific writing skills. You should ask for, and expect to be given, plenty of feedback on this exercise and the experience should be useful later, especially when compiling the Frontiers in Genetics Proposal and Thesis, both of which attract many more marks.

The primary objective is to review the background to your work but you must also include a short and concise statement (approximately 500 words) of the aims of your project and how you propose to carry it out. These statements assist in judging the relevance of the literature review to your project. Bear in mind that a scientific literature review is not simply a general summary of relevant background literature. It should be ***selective*** in the sense that it summarises the key background research that forms a “chain of progress” towards gaining an understanding of an area of Genetics, and ***critical*** in the sense that it identifies strengths and weaknesses in previous work (experimental design, data analysis, interpretation of results, etc.) and suggests ways to overcome any such deficiencies.

The initial assessment of your literature review will contribute 5% towards the final mark. This is not a large component of the assessment because it will have been completed early in the course at a time when you lack experience in writing critical reviews. We ask you to fine-tune your literature review as the course progresses. Changes can include additions, deletions and re-written sections. These changes will be influenced by, for

example, feedback provided with the first assessment, additional reading, and modifications to the aims of your research project. The modified literature review is to be incorporated into, and will be assessed as part of the thesis.

3.ii <u>The First Research Seminar</u> *(not formally assessed - 15 minutes plus 5 minutes for discussion)*

After completion of the literature review, we ask you to present a short seminar on your planned research. The seminar should contain sufficient background information to enable the audience to appreciate the nature of your project, but the emphasis should be on the project itself and include the aims and the experimental approaches you plan to adopt. This will allow members of the Discipline of Genetics to become familiar with your planned research and thereby assist you in achieving your aims. During and after the seminar you should be prepared to answer questions and enter into discussion.

While no formal assessment is made of this seminar, we strongly advise you to seek critical comments from your supervisor and other members of the Discipline of Genetics. Such feedback will help with future oral presentations that are assessed. The more common deficiencies in seminars given by past Honours students have included reading long passages directly from written notes or projected images; having excessive amounts of information displayed on projected images; failing to “engage” the audience’s interest; providing insufficient background to enable the audience to appreciate the main points you wish to make; showing a lack of a deep understanding of the topic by being unable to answer questions; giving insufficient attention to the structure of the talk - ideally the main components should follow a logical progression so that the audience can identify a developing theme; and not keeping within the time allocated

3.iii <u>Frontiers in Genetics (FiG) Proposal - Preliminary (5%) and Final (20%)</u> *(Preliminary written submission: word limit = 600; Final written submission: word limit = 2,500; Defense: time limit = 40 minutes)*

The purpose of this exercise is to give you extended experience in reading scientific literature and formulating hypotheses based on what you have read, and then to plan an original piece of research to test your hypothesis. The topic chosen should be at the cutting edge of Genetics research and cover areas of Genetics that are <u>not</u> closely related to your research project. For this purpose, areas of Genetics will be considered as “closely related” if the broad topic of investigation is similar (e.g. developmental genetics, gene regulation, genetics of disease, reproductive biology, evolutionary genetics, cytogenetics, organellar genetics, etc.), or if the same model organism or the same general experimental approach is used. The purpose of this rule is to give breadth to your Honours experience. The Honours convener will be the final arbiter should any conflict arise. Choose a topic as soon as you can, so that you have sufficient of time to develop your ideas about it. This presents an opportunity to choose personally the area for study - so select one that is of particular interest to you. The Honours Convener must first approve your FiG topic.

Your objective in the FiG proposal is to convince a group of geneticists that you have developed a novel hypothesis that is worth testing and that you have devised a logical and practical research plan capable of testing it. In developing your proposal, you will need to use imagination tempered with practicality.

Initially, you will submit a concise statement (600 words maximum) setting out an hypothesis, together with a <u>brief</u> review of the background to the hypothesis and a brief

indication of your proposed experimental approach. You should append copies of two key papers that led you to formulate the hypothesis.

You will meet for approximately 60 min with a panel of assessors who will offer advice on the hypothesis and your proposed experimental approach, and members may suggest some necessary improvements or changes in direction. Your panel will assess this preliminary work (5%), paying particular attention to the originality and quality of the hypothesis and the feasibility of the experimental approach. The written and oral components will contribute equally to the marks awarded.

You will then have approximately 4 weeks to develop a mature written proposal. You should design experiments that are within, or only marginally extend, your own experience as a research worker, and that are achievable within a year or so. You are cautioned that grandiose experiments that will take an army of talented postdoctoral scientists several years to complete are unlikely to attract a good response from the assessors. However technically routine procedures that are necessarily prolonged (such as the making of transgenics) may be included. If a significant aspect of your proposal involves the use of new methods, then these methods should be spelt out in detail. Otherwise, precise details of materials and methods are not required. References to published methods will suffice. This document, of not more than 2,500 words, should contain full references to relevant publications (not included in the word limit). Reprints of two key papers should be appended.

The mature proposal should contain:

- *the background work on which the proposal is based,*
- *the hypothesis,*
- *the predictions that follow from the hypothesis,*
- *and proposed experiments to test the hypothesis.*

In addition to submitting a written proposal, you will meet again with the same panel of assessors for approximately 60 minutes to describe and then discuss your proposal. At the commencement of this meeting, you will be asked to give a 10-minute summary of your proposal, using no more than three explanatory images. In the remaining time, you should be prepared to answer questions on your proposal.

This is very much a "self help" exercise, and while it is clearly to your advantage to test your proposal by discussing it with fellow students and members of staff before finalising your report, ***the central ideas and research plans must be your own.*** You are free to take extensive advice locally and internationally but you must not expect the panel of assessors to provide constant and detailed input. They will give verbal advice in the first interview and may enter into minor written and verbal discussions thereafter but they will not "pre-approve" ideas for hypotheses and experiments.

The following criteria will be emphasized in assessing the FiG:

- Written proposal:
    - Originality and underlying logic of the proposal; the more original the ideas the better, as long as they are of a high quality and well defended.
    - Adequacy of background information
    - Appropriateness of the hypothesis
    - Practicality / feasibility of the experiments
    - Ability of the experimental approach to allow the hypothesis to be rigorously tested

- Oral Discussion:
    - Skills in reinforcing the written proposal and in discussing the proposition
    - Demonstration of a thorough understanding of the topic and the proposed experiments
    - Clarity and adequacy of presentation

3.iv <u>Research Project: Thesis and Interview – 60%</u> *(<u>70 pages</u>, including diagrams but not including Bibliography and Appendices)*

From the outset of your research, you must maintain a ***dossier*** containing a summary of your work. The dossier will be read by members of your assessment panel once* during the course and will act as a basis for discussion and feedback. As the course progresses, particularly towards the end of the course, the dossier should be developed into a thesis. Therefore, we suggest that you compile the dossier in such a way that its evolution into the final thesis can occur with minimal need for extensive re-writing or re-organisation.

* *For some students, a panel may find that the standard of laboratory work, scientific thought or presentation apparent from the dossier submission and discussion is not of sufficient standard. In order to assist such students, the dossier must be revised and resubmitted four weeks after the initial submission date, and a further dossier meeting held. In very rare cases, where the dossier committee is still of the opinion that the work is not of a sufficient standard, the student may be required to change to an area where they may be able to make better progress.*

<u>Notes on compiling and maintaining a dossier:</u>

Using the concise scientific style of writing, record in your dossier:

- the rationale underpinning key experiments,
- all the essential experimental results required to assess your progress and achievements, and
- an interpretation and discussion of results, including an appraisal of any difficulties encountered and suggested ways to resolve such difficulties.

In the early part of the Honours course you may have few significant results. Nevertheless, the dossier should reflect the process you have followed and the progress to date. If you have carried out a number of variations of an experiment, then the dossier should introduce and discuss the most significant result. It is not envisaged that the dossier contains information about all experiments carried out (your laboratory note book will do this). Instead, the Dossier should focus on the key experiments that form part of a progression towards achieving the aims of your project. Thus, your dossier will “evolve” as your research progresses, and will be modified as a result of feedback from your examiners and changes to the directions or emphasis of your program of research. The dossier should become a logical, rather than a chronological, representation of the progress of your project, with emphasis on the rationale behind the various experiments you carried out, and a clear interpretation of the results obtained. Due to the need for regular updating, it is advisable to maintain your dossier as a computer file that can be readily printed and copied for submission when required, and that can be used efficiently to compile the final thesis.

We do not require an extensive Materials and Methods section in your Dossier or your final thesis. In many cases it will be sufficient to cite relevant references, noting any alterations. However, if the research project itself involves the development or modification of published methods, then full details should be given.

Notes on compiling the thesis:

The Honours thesis should contain the following components:

1. ***Summary***: A succinctly written 1-page summary of the research project
2. ***Introduction and Literature Review:*** An updated and modified version of the Literature Review (see previously), containing a clear statement of the aims of the project.
3. ***Materials and Methods****:* Brief – but well referenced.
4. ***Results****:* Use tables, figures and text to describe clearly and interpret the results of your research. Use full explanatory legends for figures and tables. Avoid extensive discussion in this section of the thesis.
5. ***Discussion****:* A carefully thought through discussion of your results in the context of the broader field as outlined in the literature review. Comment on any deficiencies in your results. Be careful not to "over interpret" your results. Adopt a self-critical approach where appropriate.
6. ***Bibliography:*** A full set of references to citations given in the thesis.
7. ***Appendices:*** Supplementary material and/or annotated raw data (e.g. long stretches of DNA sequence) can be placed in appendices. They should be carefully selected, and presented in a way that is easy to follow. The appendices do not form part of the page limit but should be presented only when directly relevant to the results within the thesis.

In assessing your research project, as presented in your dossier, thesis, and interview, members of the assessment panel will look particularly at the following features:

A. The originality of ideas and experimental approaches used, and the clarity of your presentation.
B. The quality and thoroughness of the experimental work, its analysis and interpretation, including -

- Have you chosen appropriate experiments to address the questions at hand?
- Have you carried out the experiments carefully and appropriately?
- Were suitable controls incorporated?
- Were the experiments designed to generate the maximum amount of information?
- Were the data generated of good quality, e.g. quality of gels, blots, cytology, histology, microscopy etc.?
- Did you show a thorough understanding of the reasons for your experiments, the nature of the experiments and the way to interpret the results?
- Were you able to derive the maximum amount of information from your data?
- Were you careful not to over-interpret your data and did you qualify conclusions where necessary?

C. The way you have dealt with technical difficulties.

- Did you carry out a carefully controlled set of experiments to trouble shoot any technical problems you have experienced?
- Did you tackle the development of any new techniques with a logical approach?

D. Your overall understanding of the field.

We realise that the nature of projects varies a great deal, from those that are largely experimental to those that involve computer based data extraction and analysis. This variation will obviously affect the way examiners assess individual projects, and each assessment panel will determine an appropriate weighting for the various components.
We ask you to submit three copies of your thesis for assessment at the end of the course. The Discipline of Genetics will retain one copy as a record, one will be provided to your

supervisor, and the third will be returned to you. As a minimum, we require the thesis to be spiral bound.

3.v <u>The Laboratory Notebook</u> *(assessed together with your thesis)*

During the course you will be required to maintain a laboratory notebook that records in detail, on a day-to-day basis, all experiments you carry out and results obtained such as labeled gel photographs, DNA sequences, etc. If your results are microscope images, then the images should be stored electronically, and your notebook should contain details of the file names, all data pertaining to the image, and location of files. We ask that you burn a CD of any important results that should be given to your supervisor. Details of all techniques used in your research project must be recorded in your laboratory notebook.

The notebook itself is not assessed but may be referred to by the examiners when making a final assessment of your research project. You supervisor will advise you how to set out and maintain a laboratory notebook. The maintenance of laboratory notebooks is standard practice throughout the scientific world and it is essential that you get into the habit of recording your work in this format, at the time when the work is undertaken. It is acceptable to refer to parts of this notebook in your dossier and thesis. Please bring your laboratory notebook to the final meeting with assessors. Laboratory notebooks remain the property of your research laboratory.

3.vi <u>Research Seminar – 10%</u> *(20 minutes plus 10 minutes for questions)*

You will present a seminar on the results of your project. Clarity of presentation, logic of the flow of arguments and quality of the data presented are important components of the seminar. The seminar series will be advertised throughout the Discipline of Genetics. Attendance by Honours students in Genetics, including those from off campus, is compulsory.

The seminar will be followed, over the ensuing week, by a meeting with your assessment panel. This will provide you with an opportunity to elaborate on any particular aspects of your project and will also permit staff to question you to clarify any points of uncertainty. After this meeting, a final assessment of your thesis will be made.

4. ACCEPTABLE LEVELS OF HELP

An essential component of the learning process during the Honours course is that you test your ideas, and your written and verbal skills, by consulting with your supervisor, members of your laboratory, and other individuals within or outside the Discipline of Genetics. However, we expect the work you submit for assessment to accurately reflect your own ideas and skills; if this is not the case, the assessment procedure becomes unfair. It is difficult to define the point at which the level of “outside” help unduly biases assessment. Nevertheless, the following general guidelines for submitted written material should be adhered to.

For the preliminary version of the Literature Review ***<u>only</u>***, it is acceptable to obtain ***detailed feedback*** from other individuals and, after careful consideration, to incorporate into your work those suggestions that you think will improve it. Such feedback may be of a detailed editorial nature and could include suggestions related to grammar, setting out, incorporation or deletion of material, etc.

For <u>all subsequent submitted work</u>, while we encourage you to approach others (including your supervisor) for comment, such comment should be of a general nature. For

example, it may be suggested that sections are unclear and need re-writing, or that certain arguments are illogical or unconvincing. However, such feedback should NOT be at a level of editorial detail that incorporates actual suggestions for re-wording or details of new ideas. Because we view scientific editing as an important skill to acquire, we expect you to hone your own editing skills in Honours, and thus we do not allow the use of commercial editing companies.

The FiG is very much a "self help" exercise, and while it is clearly to your advantage to test your proposal by discussing it with fellow students and members of staff before finalising your report, the central ideas and research plans must be your own. You are free to take extensive advice locally and internationally but you must not expect the panel of assessors to provide constant and detailed input. They will give verbal advice in the first interview and may enter into minor written and verbal discussions thereafter but they will not "pre-approve" ideas for hypotheses and experiments.

At the beginning of the course, you must carefully revise the University Policy Statement & Guidelines on Plagiarism, Collusion and Related Forms of Cheating www.adelaide.edu.au/policies/?230 ; so that you can avoid unacceptable practices relating to the use of published material.

5. TIME MANAGEMENT

The Honours course is demanding of your time, and it is essential, therefore, that you manage your time efficiently. It is common for students to underestimate the time needed to carry out laboratory work and to write up their results. We encourage you to plan ahead to ensure efficient time management; supervisors are happy to assist with this.

6. PREPARATION OF MATERIAL FOR SUBMISSION

In preparing your literature review, FiG, dossier and thesis, you should aim to reach the standard expected of good scientific writing. Care should be taken with English expression and grammar. A common problem is that students cite review articles or textbooks that are essentially "second-hand" references to pieces of original research work. Use primary sources and draw your own conclusions, which could well be different from those of a third party. ***Backup all computer files on a regular basis as loss can be devastating.***

For all submitted written material:

1. Use double spacing with 12-point font, and number pages throughout, on A4 paper.
2. Use colour printing only where it is necessary for clear interpretation.
3. Include a word count, and a signed declaration stating: *"**this work does not contain any material written by another person, except where due reference is given in the text, and the work has not been presented previously as a component of any other academic course".***

At the completion of the course, please burn a CD of all your submitted written pieces of work, including your complete thesis, and give it to the Honours Convenor when you submit your thesis.

6.i Citation

It is essential that references and/or acknowledgments are made to any work that is not your own. Although direct quotation from the writings of others would not normally be used in scientific writing, if you do choose to use quotations, they must be indicated with

quotation marks and a reference cited. When citing references to publications in the text, the name of the first author and "*et al.*" may be used when the number of authors exceeds two. However, in the bibliography, full references should be given, including the names of all authors.

Published work accessed from the scientific literature should be appropriately referenced. ***Unpublished work*** should be used sparingly and referred to only with the explicit approval of the individual(s) concerned. ***Material published via the Internet*** may be used in special circumstances. DNA and protein sequences obtained from internationally recognised databases should be referenced by giving the name of the data base (e.g. *GenBank*) and the Accession Number of the sequence. Computer programs used directly over the internet or downloaded from the internet should be referenced by author, publication details (if any) and internet address.

6.ii Figures

To produce figures you should use the simplest process that will allow clear presentation of your results. This may involve the scanning of laboratory photographs and autoradiographs and labeling them carefully using an image manipulation program. If subtle points are lost during image reproduction, reference may be made in the dossier to a page in your laboratory notebook where the result can be clearly seen. Each figure and table must have a title, and should be accompanied by a legend that explains the figure contents in a concisely and completely that is independent of the body of the text. Use colour reproduction only where essential for clarity of interpretation of the data.

7. ASSESSMENT

Two different panels of assessors will mark your work. For the research project (literature review, dossier and thesis), three members of staff will comprise the panel, one of whom will be your supervisor. For the FiG, the panel will comprise three members of staff, who will, where possible, be different to those on your Thesis panel. The research seminar will be examined by all academic staff of the Discipline, together with others who are supervisors or members of assessment panels, who are able to attend **all** presentations. Examiners will be chosen with a view to providing the necessary expertise in the topic being assessed. Please note that examiners will give particular weight to innovative and original ideas / hypotheses / experimental approaches, etc.. The Honours course is used, in part, to assess the capacity of students to undertake a PhD or career as a research scientist, and innovation and originality are two necessary attributes of a successful scientist. The marks given by individual examiners remain confidential, but students will be given an indication of the average grade obtained (i.e. First Class (high, mid, low), 2A (high, mid, low) etc.). At the end of the Honours course, marks for the various components are appropriately weighted and added together to give a single mark that forms the basis of assessment for the final Honours Degree. A final meeting of examiners will discuss the performance of each individual student.

8. SUBMISSION AND PENALTIES FOR LATE SUBMISSION

Submissions must be made at the times specified in the Honours Timetable on p3 of this booklet. Hard copies of documents should be given direct **to the appropriate panel members** whose names will be given to each student and an electronic copy should then be sent to the Honours Supervisor. When a meeting is scheduled to follow a submission, it is each student's responsibility to arrange a convenient time for themselves and the panel members (use email) and to book a venue for the meeting at the administration desk on the ground floor of the MLS building.

Deadlines for handing in written material must be strictly observed. The Honours Convener will only grant extensions to these deadlines in very special circumstances such as illness (for which you will need a medical certificate). Otherwise, work handed in late will incur a penalty of 2% per day. The Honours Convener is responsible for judging whether the circumstances merit an extension, so inform the Convener as soon as any problem that might affect your date of submission arises.

9. FEEDBACK

We will endeavour to give you as much feedback as possible, but in practice it is vital that you seek feedback from your supervisor, assessors and other members of the Discipline. To aid in this process, assessors will often make comments directly on your submitted material before it is returned. For additional comments on the FiG proposal, we suggest you approach the convener of your assessment panel. You may receive a completed feedback form for some components of the course and an example of such forms is included at the back of this booklet. The form should not be taken as giving a guide to the relative importance of different criteria noted, which will vary from exercise to exercise and with different topics.

10. SAFETY, SCHOOL EQUIPMENT AND ASSISTANCE

As part of your induction to the School and Discipline of Genetics, you will be asked to fill out a number of forms. With this information a key to the laboratory and other areas of the building and after-hours access to the building will be organized for you. Keys are not transferable to any other person and must be returned at the end of the course. After-hours access to the building by persons who are not members of the School of Molecular and Biomedical Science is not permitted. The induction system will also lead to you receiving computer network privileges and photocopier and printers PIN numbers etc. The Faculty of Sciences will hold a general safety induction. Ms Kate Millan from the Molecular Life Sciences Building will then run a short, more specific in-house safety and facilities session. A short tour showing facilities in the Molecular Life Sciences Building, including Stores, Central Services Unit, and the Administration area will be arranged.

Special regulations apply to any work with radioactive substances, with organisms containing recombinant DNA, or with animals. Specific documentation is required in these areas and before you commence any such work you must discuss the requirements with your supervisor and Ms Kate Millan.

The School of Molecular and Biomedical Science provides a large number of resources to support your work, including communal laboratory and computing equipment, clean and sterile glassware and some basic media and solutions from the Central Services Unit. Do not use any item of equipment unless you are absolutely certain how to use it. Training is essential for complex equipment. There is no piece of scientific equipment that needs force to be applied and you may do very expensive damage if you apply force. Report any damaged or malfunctioning equipment to your supervisor. If the matter is urgent or very serious report it to Kate Millan. Everyone benefits from the smooth operation of these communal facilities and it is an expectation that you will become a responsible member of the School of Molecular and Biomedical Science. Resources for your project come from the research funds held by your supervisor who will arrange for the purchase/provision of items you require for your project.

11. GENERAL FACILITIES

Use of equipment in individual laboratories: Make sure you have been instructed in the use, and are familiar with the potential dangers associated with the use, of any School equipment. Please leave general work areas as tidy, or even tidier, than they were when you commenced work. The research leader of each laboratory must be consulted prior to using any equipment, especially for the first time. Safe Operating Procedures are displayed next to all major equipment, but personal training is required for most complex equipment because potentially dangerous and very expensive accidents can occur.

Computing: Personal computers throughout the laboratories and offices are linked *via* the network and most are also linked to central computers and servers outside the Building. Word processing (MS Word), spreadsheets and databases (Excel), graphics (PowerPoint) and laser printing and colour printing are all available on the network. The cost of this printing will be debited to your supervisor's account. Internet use and printing for private purposes are not permitted.

As there is always a danger of the network being infected with computer viruses, we are obliged to ensure files coming into the School of Molecular and Biomedical Science, by any means, are scanned for viruses. It is not permitted to load any software onto School computers yourself or to change the existing system settings. This also applies to executable files downloaded from email or the internet.

Photocopiers & Printers: The School's photocopiers and printers are connected to the computer network. Material can be sent to the photocopiers via the network or by directly copying originals at the machine. Both may be used for photocopying/printing material that is relevant to your research project or other academic activities. Copies are recorded against individual PIN numbers or by monitoring the network. Private photocopying is not to be carried out.

Ordering / Materials / Store:
The ordering of materials and equipment from outside the University varies in the different laboratories and you should ask your supervisor about this. You may only order items after first gaining the approval of your supervisor.

12. SAMPLE FEEDBACK SHEET

Feedback: Introductory Seminar

Student: _____

Assessor:_____

Unsatisfactory	Just acceptable	Good			Excellent		
H 3	H 2B	H 2A(iii)	H 2A(ii)	H 2A(i)	H 1(iii)	H 1(ii)	H 1(i)
50- 59.5	60- 69.5	70-73	73.5-76	76.5-79.5	80-84.5	85-89.5	90-100

1. Was the introduction to the area of the research project clear and comprehensive?

2. Did the student clearly set out the research question(s) to be tackled, and the specific background that led to the question?

3. Were the experimental approaches to be used clearly stated and justified?

4.Was it clear that the experimental approaches proposed are appropriate, and likely to answer the research question?

5. Did the student demonstrate a good understanding of the research area as judged by the response to questions from the audience?

6. Did the student speak clearly and engage the audience in a way that stimulated interest in the research?

7. Were the support materials suitable in quality and number, and were they appropriately used?

8. Did the presentation run to time?

Comments: _____

ADVICE FOR ASSESSORS

<u>The following guidelines are for those who assess Honours candidates in Genetics.</u>
School of Molecular and Biomedical Science
The University of Adelaide

The Discipline of Genetics has set itself very high standards in achieving fairness and equity in Honours and all other levels of student assessment. The ultimate aim of the Discipline is to provide an environment in which individual students can realise their highest potential and for the staff to be in a position to recognise that level of achievement and reward it appropriately.

The following criteria are intended to help achieve a unified (not necessarily uniform) set of standards for assessors and supervisors and also they are expected to be generally helpful to Honours candidates. The points cannot be exhaustive and it must be recognised that different criteria may be necessary for specific projects. An attempt has been made to avoid producing criteria that will have to be often ignored because of "special cases". Some of the criteria that apply to laboratory-based projects will be different from those that are appropriate for computer-based project. In the end, assessors have to make a holistic decision, and to some extent an opinion is necessarily personal and subjective - but here is an attempt to set some broad guidelines.

General

All submitted work should be written in a formal style that is appropriate for communicating science. The use of the past tense is encouraged for describing experiments, though statements about the *status quo* may revert to the present tense. e.g. *"The incorporation of dNTPs into mRNA was greater in the cells treated with calcium compared with untreated controls (Fig 1, lanes 1 and 2). These results suggest that transcription rather than translation is responsible for the change observed in protein content."* The use of the first person is discouraged and colloquialisms should be avoided. i.e. phrases such as *"I didn't like the look of that gel so I had another shot at the experiment"* are unacceptable (and also extreme). Figures (in colour only when essential) should be clearly and fully labelled and both figures and tables should have brief descriptive titles followed by comprehensive but scrupulously abbreviated legends. The legends should describe and define every feature of the figure but should not contain text that interprets the results. In general it should be possible to follow the gist of the research report using only the figures and tables and their associated legends. Data should not be presented more than once (for example as a graph and as a table) unless the duplication is important for clarity and this is justified in the text. The text should be as brief as possible and absolutely clear. It should point out the salient features of the results that are presented as figures and tables and refer specifically (e.g. Fig 1, lanes 3-6) to individual components at appropriate points. The text should be free of spelling errors, grammatical errors and incorrect usage of singular and plural and the possessive apostrophe (e.g. dNTP's usually should be the plural dNTPs). The word "data" is plural. Consistency of presentation is crucial throughout the written submission: students should use widely accepted methods of citation, nomenclature, units, abbreviations, reference lists, heading formats, capitalisation, indents, margins, italics/bold/text formatting/fonts etc.
Other aspects include making appropriate choice for the division of results between main text *vs.* appendices, inclusion of proscribed statements of authorship, appropriate use of quotation and lack of plagiarism.

Specific components

Frontiers in Genetics (FiG)

In the FiG we are asking that a novel and innovative scientific hypothesis be developed, preceded by an appropriate and informative introduction and followed by a clear description of a series of incisive experiments that will test rigorously the validity of the hypothesis. In other words we expect the student to apply the scientific method to a new idea and, classically, describe experiments that will disprove the hypothesis if it is incorrect. These experiments should include some or all that are genetical in nature, consistent with the award of an Honours degree in the discipline. The experiments should include description and justification of appropriate controls and the variety of possible outcomes should be included. If the experiments are interdependent (i.e. sequential and reliant on previous steps), contingency plans should be included and discussed. The best experiments are those that are the most simple that allow the most stringent tests of the hypothesis. The suggestion of an over complex method is a shortcoming if a simpler approach would do equally well or better.
At interview, the student should demonstrate a very detailed knowledge of the background and familiarity with the practical aspects of the proposed experiments, together with an ability to interpret the results that might be expected. The Discipline of Genetics has found that the best FiGs have been produced by students who have initially read broadly in an area, followed by very detailed reading of carefully selected key papers. The latter should be understood at the level of detail that would be required to give a Journal Club presentation to a disparate group of scientists and be able to answer questions correctly and authoritatively. Experience has shown that novel hypotheses and high quality proposed experiments result from this, and only this, process. The panels should read and assess the FiG and frame the interview with this expectation in mind.
Assessors should not enter detailed discussions with the students that may be interpreted as prior approval of the documents that will be submitted. Assessors should not lead the students towards their own (i.e. the assessor's) ideas.

The Thesis

The thesis reports only 9 months of research such that good results may have been obtained or they may have been elusive. A high class assessment is equally possible in both these conditions provided the thesis and the research it reports are carefully presented, the research is technically competent and the student has a mature appreciation of, and ownership of, the project. In Genetics we do not expect supervisors to allow projects to be thought of as the first year of a higher degree, so normally there will be at least a component of the thesis that is able to report successful “bread and butter” experiments. Higher risk experiments may have been attempted that may or may not show success. Success at the bench is normally a product of the amount of work and, importantly, the degree of understanding of the nature of that work. i.e. students who know what they are doing often achieve more and higher quality results. This understanding normally stems from the student’s own effort to read widely and to ask questions to clarify points as they arise. It also enables a student to write a mature discussion that sets their work in its context and shows a clear understanding of the broader field. Students who can work only under strict supervision, essentially as technicians, are unable to do this well. Therefore a large amount of work as assessed by the results achieved, while important, is not the only factor required for high marks. In any event students must make the most of their results but scant results must not be over interpreted. Making confident conclusions from incomplete of poor quality data is a serious defect. Similarly overemphasis on “future work” may signify a weakness in the report. The description of the results should

demonstrate “ownership” of the project and a consequent ability to place the results in their broad context in the discussion.

Supervisors and assessors should show enthusiasm for the research conducted by the Honours student but they should make sure they do not give a false impression of the value of the results and their potential impact in the real scientific world. This is a difficulty balance to reach in some cases.

The Final Seminar

Whilst a confident and polished presentation is expected, a superficial broad-brush generalisation is not appropriate. Sufficient specific experimental detail should be given such that the audience can themselves determine whether the interpretation is justified. Great care needs to be taken to discern the difference between a confident but superficial or over selective performance compared with a lower-key but possibly better grounded verbal report. In general examiners tend to err on the generous side in this assessment because they recognise the difficulty of giving seminars under stressful circumstances.

Further comments as Convener

Assessments must involve a balanced appreciation of these multiple factors and this will always be difficult because the balance may vary considerably between projects. Supervisors should take this into account when designing and assessing Honours projects and when advising students during the course of the year.

As a joint assessor it is wise to avoid giving your personal opinion directly to a student without collegial consultation (for example say *“That was brilliant!”* during question time after a Seminar, as it may turn out that your opinion is an outlier and may give the student a false impression of their performance.

We will ensure opportunities for discussion between assessors at each stage of the procedure. Most importantly, there will be the traditional, very careful, discussion about each individual student at a final examiners meeting. All primary supervisors should try their best to attend this meeting, or send a knowledgeable proxy, or send a detailed written submission about their student(s).

Jeremy Timmis, Genetics Honours Convener 2011