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INTRODUCTION

Welcome to the BSc Immunology course run by the Division of Immunology, Infection and Inflammation! We hope the part you play here in the pursuit of learning will prove valuable and enjoyable to yourselves and to the Division. This year we have a record number of students studying with us, with a class size of 26.

This course was the first ever B.Sc. course in Immunology in the U.K. and is possibly the best known. It began in 1975 with a small band of seven student pioneers, and we consider it to be one of the best things that has ever happened to Immunology. During the lifetime of the Course, Immunology has been one of the most exciting and fast growing of the biological sciences, spreading far beyond the bounds of its original field of protection against infection, and many of our graduates have made major contributions to this growth.

Immunology started with attempts to understand how we are able to combat infections, and how to encourage this by vaccination. Since then it has expanded rapidly to embrace allergic reactions, transplantation immunology, cancer immunology, autoimmunity, tolerance and the application of immunological methods to medical diagnosis, immunotherapy and other sciences. This expansion of knowledge is still continuing.

The lecturers on the Hons. BSc Immunology Course are drawn mainly from the Division of Immunology, Infection and Inflammation (Head of Division, Professor F. Y. Liew) with others coming from other Divisions of the Medical Faculty or IBLs. Teaching staff from many other University and hospital departments make important contributions and one of the strengths of the course is that you will be taught by lecturers who, in many cases, are conducting research in those areas they are lecturing on.

Dr. J. A. Gracie (j.a.gracie@clinmed.gla.ac.uk) is the coordinator in charge of the Junior Honours Immunology B.Sc. course. Please feel free to contact him in the first instance if you have any issue regarding the course.

The selection process for the Junior Honours Year is based on the expectation that you will all enter the Senior Honours year and undertake a supervised research project. The planning of the practical classes in the Junior Honours year is designed to cover a wide range of techniques in both basic and applied immunology and, on the basis of the experience and knowledge you have gained during the course, you should be able to make a well-informed choice of subject for your Senior Honours year research project.

I wish you an enjoyable and successful two years.

J. Alastair Gracie
Course coordinator

Aims of the Course

We aim to equip you with:-

- knowledge, understanding and skills that will enable you to play a full and satisfying part in an immunological career,
- transferable skills that will enable you to move into quite different fields of endeavour, and will be of practical use in everyday life,
- cultural enrichment that will add to your self-confidence and quality of life.

Learning Objectives

This year you will gain a broad range of understanding of the nature and function of the immune system, including :-

- mechanisms of protection against infection
- hypersensitivity reactions
- autoimmunity
- tolerance
- transplantation immunology
- the immune response to cancer
- application of immunological methods in other sciences and in medicine
- research techniques, including methods of molecular biology.

A knowledge of accepted “facts” is necessary, but by itself, falls far short of our objectives. It is not possible to get good marks in honours exams by simply memorising facts or, what is even worse, by memorising words without understanding their meaning. We see it as crucially important that you also attain the following objectives:-

- an understanding of the principles of Immunology, as demonstrated by the ability to apply your knowledge to new, unfamiliar, practical problems,
- an understanding of the evidence on which our knowledge of Immunology is based, and the strengths and weaknesses of that evidence,
- an understanding of the logical processes by which scientific knowledge is derived empirically from observation,
- the skill of critically weighing evidence and judging the credibility of scientific conclusions,
- the skill of thinking of alternative explanations for an experimental result, in addition to the most obvious explanation,
- the skill of formulating hypotheses and designing experiments to test your hypotheses,
- the skill of searching out published information and organising it into a coherent summary,
- the skill of expressing scientific information and ideas clearly in writing and in speech,
- the skill of conducting practical laboratory work and collaborating with others,
- an understanding of the traditional ethos of science, including a love of learning and a commitment to objectivity, truth, openness, freedom of discussion, freedom of thought, freedom of publication,
- the development of your intellectual strength through the study of interesting and intellectually challenging ideas, and through practice in formulating original ideas of your own.

BSc Immunology Junior Honours Students 2007 – 2008

Matric No	Surname	Forename(s)	Email
0302939	Alexander	Natalie	0302939A@student.gla.ac.uk
0503999	Ball	Dimity	0503999B@student.gla.ac.uk
0502668	Boyle	Amy	0502668B@student.gla.ac.uk
0504970	Coakley	Ian	0504970C@student.gla.ac.uk
0502017	Dalziel	Catherine	0502017D@student.gla.ac.uk
0501688	Forbes	Eleanor	0501688F@student.gla.ac.uk
0502544	Harden	Kimberley	0502544H@student.gla.ac.uk
0502836	Hassan	Rachel	0502836H@student.gla.ac.uk
0509198	Herrington	Felicity	0509198H@student.gla.ac.uk
0503307	Hirst	Fiona	0503307H@student.gla.ac.uk
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0506218	Mathisen	Stephanie	0506218M@student.gla.ac.uk
0509576	McCamley	Colin	0509576M@student.gla.ac.uk
0609548	McCrossan	Cara	0609548M@student.gla.ac.uk
0502865	McDonald	Gavin	0502865M@student.gla.ac.uk
0502699	Melville	Blair	0502699M@student.gla.ac.uk
0502547	Mitchell	Paula	0502547M@student.gla.ac.uk
0308667	Nazir	Anbrien	0308667N@student.gla.ac.uk
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0507918	Siddique	Zahra	0507918S@student.gla.ac.uk
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0507276	Young	Andrew	0507276Y@student.gla.ac.uk

Key to Staff Initials

Initial	Name	Address	Telephone	Email
HA	Ms. H. Arthur	Division of Immunology, Infection and Inflammation	8141	hma1a@clinmed.gla.ac.uk
ED	Prof. E Devaney	Dept. of Veterinary Parasitology	6925	E.Devaney@vet.gla.ac.uk
TE	Prof. T. Evans	Division of Immunology, Infection and Inflammation	8417	t.j.evans@udcf.gla.ac.uk
AF	Miss A. J. Faichney	GU Library	6711	a.j.faichney@lib.gla.ac.uk
EJF	Dr E. J. Fitzsimons	Dept. of Haematology, Western Infirmary, Glasgow		ejf1s@clinmed.gla.ac.uk
AFr	Dr Alistair Fraser	Division of Immunology, Infection and Inflammation	8133	a.fraser@clinmed.gla.ac.uk
JAG	Dr A. Gracie	Division of Immunology, Infection and Inflammation	8130	j.a.gracie@clinmed.gla.ac.uk
GG	Prof. G Graham	Division of Immunology, Infection and Inflammation	3982	gpma09@udcf.gla.ac.uk
AG	Ms Angela Greirson	Division of Immunology, Infection and Inflammation	8131	a.grierson@clinmed.gla.ac.uk
PH	Dr. P. Hagan	IBLS	5765	p.hagan@bio.gla.ac.uk
KH	Dr K. Hadley	Dept. of Bacteriology, University of Glasgow		k.m.hadley@clinmed.gla.ac.uk
MMH	Prof. M. Harnett	Dept. of Immunology, University of Glasgow	8413	m.harnett@bio.gla.ac.uk
FYL	Prof. F. Y. Liew	Dept. of Immunology, University of Glasgow	8411	fyl1h@clinmed.gla.ac.uk
RMC	Dr. R. McCulloch	IBLS,	3579	rmc9z@udcf.gla.ac.uk
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CMcS	Dr C. McSharry	Division of Immunology, Infection and Inflammation	8378	cms4q@clinmed.gla.ac.uk
AM	Dr A Melendez-Romero	Division of Immunology, Infection and Inflammation	8415	A.Melendez-Romero@clinmed.gla.ac.uk
RN	Dr. R. Nibbs	Division of Immunology, Infection and Inflammation	3960	rjn8k@clinmed.gla.ac.uk
PS	Dr. P. Shiels	Dept. of Surgery, Royal Infirmary		p.shiels@clinmed.gla.ac.uk
DIS	Dr D. I. Stott	Division of Immunology, Infection and Inflammation	8417	D.I.Stott@clinmed.gla.ac.uk
MTat	Dr M. Tatner	IBLS	6246	m.tatner@bio.gla.ac.uk
MT	Dr M Thomas	Dept of Immunology, Western Infirmary		Moira.thomas@northglasgow.scot.nhs.uk
NT	Prof. N Thomson	Division of Immunology, Infection and Inflammation		n.thomson@clinmed.gla.ac.uk
DV	Ms. D. Vaughan	Division of Immunology, Infection and Inflammation	8141	dmv1y@clinmed.gla.ac.uk
DX	Dr D Xu	Division of Immunology, Infection and Inflammation	8415	d.xu@clinmed.gla.ac.uk

All are University numbers. Dial number from internal or prefix with 330 from outside

READING

The books in this reading list are given a star rating to indicate their usefulness for the course, as follows:-

****Strongly recommended that you buy at least one** of these books.

***Recommended:** you should look at these books and consider buying them.

No star: Recommended for consultation when more detailed or specialised information is needed.

Lecturers will also recommend books, review articles and research papers dealing with each topic in detail during the course.

Many of these books and others are available on loan from the University library. Many journals can be accessed via the internet from the G.U./W.I.G. campus and, in some cases, papers can be downloaded and printed.

General Immunology

****** Janeway, Charles. A., Travers, P., & Walport, M. 6th Edition, 2005, Immunobiology: the Immune System in Health and Disease, Garland Science, £41.99.

****** Abbas, Abul K., Lichtman, A. H. & Pober, J. S., Cellular and Molecular Immunology, 6th edition, 2005, Saunders, £41.99.

****** Parham, P. 2005. "The Immune System" 2nd Edition, Garland Science. £35.

***** Kindt, T.J., Goldsby, R.A., Osborne, B.A. & Kuby, J., Immunology, 6th edn. 2006, W.H. Freeman, £41.99.

***** Roitt, I. M. & Brostoff, J. 2006. Immunology, 7th Edition, Mosby, £36.99.

Roitt, I.M., Essential Immunology, 11th Edition., Blackwell, 2006, £36.99.

Clinical Immunology

Chapel, H. *et al.* Essentials of Clinical Immunology, 4th ed., Blackwell, 2006. £34.99.

Nairn, R. & Helbert, M. Immunology for Medical Students, Mosby, 2004, £24.99.

Molecular Biology

Nicholl, D.S.T., 2002, An Introduction to Genetic Engineering, Cambridge University Press, £15.95.

Hartl, D.L. & Jones, E.W., 2001, Genetics: Analysis of Genes and Genomes, 5th Edition, Jones & Bartlett, £29.99.

Infection & Immunity

Playfair, J., Infection and Immunity (2004), Oxford, £22.99.

Medical Microbiology, Mims, £38.99

Mims, C.A. 2000 The Pathogenesis of Infectious Disease, 5th edn., Academic Press, £30.95.

Pathology

MacSween, R. N. M. and Whaley, K., 2000. Muir's Textbook of Pathology, Arnold, 14th Edition, £35.00.

Words

*****Herbert, W. J., Wilkinson, P.C. & Stott, D. I., A Dictionary of Immunology. 4th Edn. Academic Press, 1995, £44.95.

Cruse, J.M. & Lewis, R.E., 2nd edn., 2002. Atlas of Immunology, CRC Press, £51.49. More up to date but also more expensive and less portable.

Barclay, A.N. *et al.*, The Leucocyte Antigen Facts Book, 2nd edn., Academic Press, 1997, £44.95. A very useful reference book.

CLASS INFORMATION

All teaching sessions including lectures and tutorials will be held in our teaching room (403) on Level 4 of Immunology Building. Laboratory classes will be held in teaching lab (301) on 3rd floor of same building. Check timetable for any other locations.

ATTENDANCE

Students are expected to attend and be willing to participate in all parts of the course. Completing a degree in Immunology requires more than merely attending lectures. Work covered in tutorials can also be examined. The practical sessions count towards continual assessment and therefore overall grade. Students must notify Dr Gracie should extended absence be required. It would also be expected that students contact lecturers directly about any part of the course missed. All extended absence must be explained to Dr Gracie and if appropriate a medical certificate provided.

READING

Most of the literature you will need to read over the next two years can be accessed electronically from any computer with access to the University network/library. Paper copies are also held in library.

Students should consider VPN if not already aware of this service. Ask Dr Gracie.

COURSE FEEDBACK

At the back of this handbook are pages for student feedback. We ask you to complete these during the session, ready for the feedback sessions at the end of each semester. Copies are also available on Moodle.

UNIVERSITY LIBRARY

There will be a session given by Ms. Alison Faichney on literature and database Searching on Thu 18th October from 14:00-17:00 OR Fri 19th October from 14:00-17:00 (see timetable). The Class should meet at the automatic entry point near the reception desk on Level 2 of the University Library. If you bring your first essay title and notes, the Tutor will show you how to find relevant publications. You will be shown how to use the indexing and bibliographic searching systems.

Ask where to find Immunology textbooks. Several including the previous version of Immunobiology are available on-line via Pubmed.

Students will also be able to use the computers at back of teaching room (403) to access library and internet in accordance with University regulations.

ESSAYS

You are expected to write a total of 4 essays during the academic year. Titles will be distributed approximately 3 weeks in advance of hand in date. Two of the essays will be open book (approx 2000 words) and those marked ** will be written as "closed book" under exam conditions after you have had time to research the title (approx 1500 words). This will give experience of writing under exam conditions before you have class and degree examinations. Short tutorials will be arranged, at which the tutor will discuss with you the scientific content of your essay and aspects of its presentation. Almost all of the advice on "How to Pass Examinations" also applies to the essays. There will also be tutorials on writing essays and examination techniques throughout the term.

These essays will help you to learn how to seek out information, and integrate it into a critical discussion. With the help of individual advice, you should aim to develop your scientific writing skills to a high standard. The essay marks will contribute towards the degree examination (see Examinations,).

	Date for distribution of essay titles	Date for submission of essays
Essay 1	Fri. 16 th Nov 2007	Fri. 14 th Dec 2007
Essay 2	Fri. 14 th Dec 2007	Wed 9 th Jan 2008**
Essay 3	Fri. 22 nd Feb 2008	Fri. 14 th Mar 2008
Essay 4	Fri. 14 th Mar 2008	Wed 9 th April 2008**

Open essays are to be submitted to Dr Gracie, the Course Coordinator, for marking. We will have a “post box” within the teaching room, where all material for staff members can be left. Essays not handed in by noon on the deadline date may not be marked, in which case they will be rated **zero**. **Marks will be lost for poor English and illegible handwriting.** If you are unable to complete an essay for good reason, e.g. illness, you should inform Dr. Gracie as soon as possible before the deadline and hand in a medical certificate if required.

LABORATORY NOTEBOOKS

You are expected to keep a laboratory notebook (A4 size, ring file) in which a compendium of laboratory techniques and records of experiments is to be built up during the year. The first practical laboratory session will give more detail on this. In many of the laboratory experiments some of the necessary technical information will only be provided on the blackboard or verbally and this should be carefully noted at the time for inclusion in the laboratory report. A report will be required for each experimental block. This should include:-

- A **concise**, informative description of the technical procedures in the past tense - you are describing what you did. If you are provided with a protocol sheet, you may refer to it in

your Materials & Methods section, adding any alterations to the protocol, whether intentional or inadvertent. **It is not necessary to repeat the description on the Protocol Sheet.**

- **All** observational data, including any unexpected ones, e.g. colour changes, precipitation etc., should be recorded clearly and systematically. Quantitative data should be presented in tabular or graphic form, as appropriate. **All** steps in calculations should be clearly explained.
- The Discussion should assess the significance of the experimental results by comparison with the accepted body of knowledge.

Keeping a good laboratory notebook therefore, will help for the preparation of the reports.

The marks given for laboratory report are used in assessing your performance during the year and will contribute towards the degree examination (see Examinations p.11). They will also be taken into account when providing references for summer employment.

If you are unable to complete your report in time through illness or other good cause, you should inform Dr Gracie as soon as possible and present a medical note.

WEB SITE / MOODLE

Our Website is:

<http://www.gla.ac.uk/departments/immunology/education/lectures/juniorhonours/index.htm>

Moodle will be used for posting of course information, handouts, lecture notes etc. More information on accessing this will be given during class

TUTORIALS

The Immunology tutorials are a core part of the course, often dealing with topics that are not covered anywhere else. These are usually the more debatable topics, of the sort most likely to appear in the exams. Students are expected to attend all tutorials.

There will be various kinds of tutorial:-

- Feedback tutorials on the essays that you write (see page 8)
- Two-hour subject tutorials and revision tutorials attended by the whole Class. In advance of each tutorial, you may be given a list of questions to be discussed or material to read in preparation for the tutorial. In some tutorials, you will be divided into groups and each group given a separate topic to find information on for presentation to the rest of the class. Any prescribed reading is a core part of the Course, and can be examinable.

OPTIONAL COURSES ON INFORMATION TECHNOLOGY

The University Information Technology Education Unit (ITEU) runs courses on computing software and the internet for students at basic and intermediate level. There are both self-teaching packages accessible from any on-line computer and taught courses leading to a certificate of competence. It should be possible to attend most of these without missing your other classes. You can register on-line or at the ITEU office in the round reading room. If you are not already computer-literate, this is an opportunity not to be missed.

OTHER COURSES

During the Junior Honours year you can take an additional subject if you wish to do so. There is no restriction on the subject taken, other than availability of places, but you must make sure that the timetable does not clash with the Immunology course.

SEMINARS

Research seminars are held within the Department at lunchtime, normally on Wednesdays during term. They are usually given by invited speakers of national recognition who present the results of their own research or reviews of selected areas of Immunology. Details will be posted on the student noticeboard. You are encouraged to attend these seminars. Examination answers tend to be treated very favourably if they incorporate relevant material gleaned from seminars.

WEST OF SCOTLAND IMMUNOLOGY GROUP

The West of Scotland Immunology Group meets monthly during each term at 18:00 with wine from 17:30 in the Wolfson Medical Building. The speakers are internationally renowned immunologists invited from outside Glasgow, often from abroad. Details will be posted on the notice board and students are encouraged to join. Membership costs £1 per annum for students. Application forms can be obtained at the meetings or from Dr Gracie.

EXAMINATIONS

Class examinations

There will be a written class examination on Friday 15th February 2008, from 09.30 to 12.30. This will consist of essay and problem-solving questions. Performance in the class examination will contribute towards the mark in the junior honours degree examination. You should bring a calculator with you.

Degree examinations

The external examiner will be Professor D Wraith, Department of Pathology and Microbiology, University of Bristol. **The provisional dates for**

the degree examinations are: Tue 7th – Thu 9th May 2008.

Students should check the student notice board /Moodle for any changes to the above.

Papers I and II:

You will be required to attempt essay style questions in each of these papers.

Paper III:

Paper III will consist of two compulsory problem questions which may be numerical and/or interpretative. **This is an open book exam and therefore you will be allowed to consult textbooks and notebooks, and you must bring a calculator.** Statistical tables will be provided if necessary. Up to 4 hours will be available.

A mark from continuous assessment of your work throughout the course, including your essays, laboratory reports and class examination mark will also be used. For this reason it is essential that the class co-ordinator should be informed of the reasons for absence from classes or from the class examination, and a medical note must be provided for absence of greater than five days through illness.

An Advanced Ordinary (Special) (AOS) pass in the Degree Examination is required for advancement to the Senior Honours B.Sc. course. The mark required for an AOS pass is 50%. Your performance will be recorded as a grade. An AOS pass may be grade A, B, C, or D. An AO pass corresponds to marks in the range 40 to 49 per cent, and is reported as a Grade E. It qualifies you to graduate with a Designated Degree, provided that the grade point average for your whole course is 10 or more. Grade F is a fail. **The overall mark obtained in the JH examinations will contribute 20 per cent of the final Degree Mark at the end of the Senior Honours course.**

Oral examinations

All students are required to be available for an oral examination,

provisional date for which is Fri 1st June 2007. Exact date and times for each candidate will be displayed on the notice board. A good performance in the oral examination can increase your overall mark, and thereby shift borderline candidates to a higher grade. Selected students may also be required to present themselves for oral examination by the external Examiner during the same week. **All students must therefore be available throughout the whole oral examination period** in case they are selected. By the time of the oral exam, you should have told the Senior Honours course coordinator (Prof. Allan Mowat) your choice of a final year project.

The overall assessment for the year comprises:

Essays 15%
Practical Class 20%
Class exam 5%
Degree Exam I 24%
Degree exam II 24%
Degree exam III 12%

GENERAL INFORMATION

There will be a notice board for the BSc Immunology class within the teaching room. This board will be used to post information on changes to the timetable, examination dates, departmental seminars, summer vacation jobs, etc. You are advised to consult the board regularly. Remember also to check Moodle

M.Sci DEGREE

A small number of students may be permitted to spend one year between Junior Hons. and Senior Hons. on the work placement scheme, leading to a M.Sci. degree. Entry will be dependent on performance in first and second year and a minimum GPA of 12.0 is required. The course coordinator should be notified as early as possible in the first term if you wish to be considered for a M.Sci.

PLAGIARISM

Plagiarism is copying others' work and passing it off as your own. It is cheating and an offence against University discipline. Plagiarism includes 'the direct copying of textual material, the use of other people's data without acknowledgment, and the use of ideas from other people without adequate attribution'. This can involve copying out passages from books or articles, copying from another student's work, or making available material to another student in the knowledge that the other student will make use of the material for plagiarism. Copying material from web-sites will be treated in the same way as copying from books.

The department will apply strictly the following guidelines on plagiarism:

- All written work submitted should be in your own words as far as possible
- Sections of complete text of more than a few words should not be copied directly from another source, unless the source material contains information that cannot be expressed in any other way without loss of meaning
- Minor alterations to the wording of copied text to make it appear to be in your own words is not acceptable and will be considered to be plagiarism.
- All material cited directly must be acknowledged and referenced - placing in quotations (“ ”) is not sufficient
- Wherever possible, Figures and Tables in source material should be redrawn with clear labelling. If this is not feasible, use of direct copying should be restricted as much as possible and these should be acknowledged fully
- Most credit will be given to pieces of work which contain least direct citations
- Each piece of written work submitted will be accompanied by a signed declaration in which the student confirms they have read and accepted these guidelines and that the work is original (see below)
- All written work will be submitted in hard copy and electronically. Electronic versions may be submitted to scanning by plagiarism detection software
- Any student found to be in breach of these rules will be awarded zero marks and, on the first occasion, will be referred to the Director of the Undergraduate School who can refer the student to the Senate Assessors for Discipline. Repeat offenders may be subject to immediate expulsion from the course

Further details can be obtained in the official University Statement on Plagiarism may be found in the “University Fees and General Information for Students” section of the *University Calendar* and at:

<http://senate.gla.ac.uk/discipline/plagiarism/index.html>

Any student who is still in doubt about what constitutes plagiarism should consult the course coordinator.

**SAMPLE PLAGIARISM DECLARATION - AVAILABLE FOR DOWNLOAD
FROM MOODLE**

**DIVISION OF IMMUNOLOGY,
INFECTION &
INFLAMMATION**

BSc Senior Honours Immunology



**UNIVERSITY
of
GLASGOW**

Front Cover Sheet

To be completed for every piece of work submitted

Name: _____

Matric No: _____

PLAGIARISM DECLARATION

I confirm that **this work is my own**, that work from other sources has been acknowledged appropriately and that nothing in this work constitutes plagiarised material, as defined in the Course Handbook.

I understand the meaning of the term plagiarism and I have read and understand the University guidelines on plagiarism as found in the “University Fees and General Information for Students” section of the *University Calendar* and at: **<http://senate.gla.ac.uk/discipline/plagiarism/plagstate.html>**

I understand that breaching these guidelines is a disciplinary offence which may result in expulsion from the course.

Signed: _____

Date: _____

How to pass examinations

Many students lose marks as a result of bad examination technique. Here is how to make sure it doesn't happen to you.

1. Read the Questions. Sounds obvious, doesn't it? But this is where disastrous mistakes are made every year. Read the whole paper from beginning to end, ticking the questions you may wish to answer. Before you answer any question, **read it again carefully until you are sure you understand what the examiner intended.** Otherwise the examiner may regard your work as irrelevant and give you very few marks. If the question says "*Discuss . . .*" then you must **discuss**; it is not good enough to give an account of the accepted facts. "*Compare and contrast A with B*" means precisely that; don't simply write a list of what you know about A and B. If the question is about induction of tolerance, there is no point in writing an essay on immunosuppression. If there is any serious doubt about the intended meaning or scope of the question, assume the most reasonable interpretation and state clearly at the beginning of the essay what interpretation you have used. This will make it more likely that your interpretation, even if eccentric, may be considered plausible.

2. Plan your Answers. Prepare a plan of your answer on the first page, in the form of brief notes or a simple list of the topics to be included. This will help you to remember all the major points that should be covered and will enable you to order them in a logical sequence **before** you begin. You can then write a structured essay rather than a rambling discourse, or a jumble of disconnected statements. If, while you are writing, you think of additional topics to be included, and you have already passed the point where they are best inserted, the extra section may be added as a footnote at the end of the examination book, the position being indicated by an asterisk or other symbol. The 5-10 minutes spent in planning your answer will usually earn you far more marks than the same time spent in adding a few more sentences at the end of a badly planned essay.

When you have completed the essay, remember to cross out the notes you made at the beginning if you do not want them to be read by the examiner.

3. Structure. Make sure that the large-scale structure of the essay is clear to the reader. You can do this with headings and sub-headings if you wish. You can also do it with link sentences; i.e. sentences at the beginning or end of a paragraph that indicate how one paragraph is related to another.

The first paragraph often explains what the words of the title mean, what the subject is and why it is important. Subsequent paragraphs usually set out facts, hypotheses, arguments and counter-arguments. Discuss the experimental or observational evidence for and against any hypotheses that you put forward, bringing in information derived from your own reading on the subject and, if possible, any ideas of your own. You will gain extra marks if you can show that you have done further reading and for your own ideas, provided they are reasonable. The last paragraph often summarises the essay, drawing the various topics together.

4. Figures and Tables. Do not hesitate to use diagrams and graphs. They can be very helpful in explaining a point and are often essential, e.g. in describing the structure of a molecule or a signalling pathway. However, they also provide plenty of scope for ambiguity. An arrow drawn from cell A to cell B can mean that cell A stimulates cell B, that it suppresses cell B, that it moves towards cell B, that it differentiates into cell B, or that it transfers some substance to cell B. You have to say what an arrow means. A graph without labels on the axes, or a table without labels on its rows or columns may be worse than no illustration at all. The remedy lies in labels, titles, captions and legends.

Make sure you refer to the illustrations in the text. They are not a substitute for discussion.

5. English. The marks awarded for an essay tend to be influenced by the quality of English used by the writer, whether or not the examiner consciously wishes it. Your knowledge and insight may not be at all apparent if badly expressed. It therefore pays to write in good, plain English. Read some books on the subject if necessary (e.g. E. Gowers, *The complete plain words*).

In scientific writing, one literary attribute to cultivate and value above all others is clarity of meaning. Habitual care with syntax, grammar, punctuation and spelling tends to promote clarity. Try to arrange that the most closely related parts of a sentence are as close together as possible. Otherwise you might get, as a result of fragmentation, albeit accidental, of some of the clauses, a sentence like this one that is, although grammatically passable, syntactically poor and therefore awkward to read. Explain all NSA's (non-standard abbreviations) when they are first used, or else by a key at the beginning of your essay. IgG, DNA, BCG and C1q are quite acceptable in an immunological context, but if you need to use PTA, EAC, TPI, FITC, etc., explain what they mean.

Aesthetic aspects of your style also create a good impression. Examiners do not expect an ornate style, and there is no obvious merit in long, sophisticated words. If they give the intended meaning, simple, familiar words are usually best. Variation in the length of sentences helps to avoid monotony. Very long sentences are sometimes needed, but too many of them tend to numb the reader's mind.

6. Handwriting. NO MARKS are given for illegible material. Answers that are legible only with difficulty tend to be marked poorly because some of the meaning is lost, and even a masterpiece of prose never seems very impressive if it can only be read haltingly with frequent reading errors.

7. Time. IT IS CRUCIALLY IMPORTANT TO ALLOCATE YOUR TIME SO THAT YOU CAN ANSWER ALL THE QUESTIONS REQUIRED.

If you have organised your time well, you will have a few minutes left to check your answers and to check that you have filled in the front page of the answer books. Students sometimes enter the wrong question number on the front page. If this is not spotted by the examiner there is a risk that very low marks may be awarded because of apparent irrelevance.

It does sometimes happen that the time has expired before the last answer has been completed. Should this happen, your notes made at the beginning may come to your rescue. In that case, do not cross them out but leave them for the examiner to read and continue your essay in note form. You will be given credit for these notes, although not as much as for a well structured essay. Should you have planned your time so badly as to find you are left with only a few minutes to answer the last question, the entire question may be answered in this way, although this is recommended only in a dire emergency. Remember that the first 30% of marks for a question are very much easier to earn than the last 30%, hence the most important advice of all - **always answer the required number of questions!**

The Staff wish you every success. The standards that you attain will reflect back on us all.

Applying for Summer Jobs

Many immunology students take paid employment in a laboratory during the summer vacation between Junior and Senior Honours, and those who have done so benefit immensely from the experience. Some of the jobs are overseas, particularly in the USA. The Departmental staff will help as much as they can with advice, writing references etc. However, the task of actually finding a job rests with the students. There are various ways of going about this:

1. Probably the most successful is to talk to students in Senior Honours who found work last year. If they did well, the lab may be pleased to receive another student next summer.
2. Occasionally we receive offers of summer jobs. These will be posted on the students' notice-board.
3. The commonest way (especially for US jobs) is to write 'on spec' to labs you'd like to work in, using names and addresses obtained from papers published in immunological journals. This tends to be a low-yield exercise, and those who succeed are usually those who started earliest (mid-November is a good time to start) and wrote the most letters.
4. If you are offered a job, do make your decision to accept or decline the offer as quickly as possible, i.e. within a few days. If you don't want the job somebody else will and it is unfair to keep the group leader, who is a very busy person, hanging on for a long time and eventually turning down the offer.

Funding

Some of the labs will offer you a job without any pay. This is not much good unless you have private means of support and/or happen to have a friend/relative in the area who could offer free accommodation. There are a few trust funds available that provide some support, but never enough to cover the whole cost of 2 months living away from home, let alone the fare to a foreign country. If you get lucky and receive an offer with funds attached, we shall be happy to advise on whether it's adequate. In the USA, \$1000 per month would be a minimum, and you'd need more if you have to

pay for private accommodation in expensive cities like Boston or San Francisco. Subsidised accommodation can often be arranged in student halls etc.

General Points

1. Prepare a good CV. Staff will be happy to look over your CV and advise if any improvements could be made.
2. If you are planning to apply to trust funds, e.g. the Cross Trust, please let Dr. Stott know, as the trustees will not want to be inundated with lots of individual requests, and we may need to select who applies.
3. Some schemes are available such as Wellcome or Nuffield summer studentships and (for intercalating students only) Scottish Office intercalating studentships. These require the application to be made by the lab where you hope to work, not by you yourself, so it is necessary to select a lab and talk to the potential supervisor first. Carnegie awards also require a lab to have been identified, and applications have to be submitted via the Dean, who selects which ones will go forward. These organisations all have deadlines for application so, if you are thinking of applying, find out the deadline as soon as possible.
4. If you get a job offer in the USA, you may need a work permit, and it is the employer, not you, who has to initiate this. American scientists tend to be very ignorant about the requirements for foreigners working in the USA, and you may have to tell them what to do (we can help with this). Don't leave it too late - students have occasionally lost good offers because the paperwork wasn't completed in time.

Dr Gracie is happy to answer questions and give further advice about summer jobs.

LECTURES AND TUTORIALS				
		FIRST SEMESTER 2007-2008		
DAY	DATE	TIME	TOPIC	LECTURER
Tue	25/09/2007	09:30	Welcome to course	JAG
Wed	26/09/2007	09:30-10:45	Haemopoiesis	GG
Thu	27/09/2007	09:30-10:45	History of Immunology	DIS
Thu	27/09/2007	11:00-12:15	Evolution of Immune Response	MTAT
Mon	01/10/2007	09:30-10:45	Cells of Immune Response	CMcS
Tue	02/10/2007	09:30-10:45	Innate Immunity	JAG
Wed	03/10/2007	09:30-10:45	Neutrophils/phagocytes	JAG
Wed	03/10/2007	11:00-13:00	Eosinophils and basophils	CMcS
Thu	04/10/2007	09:30-10:45	Acute Phase Response	CMcS
Fri	05/10/2007	09:30-10:45	Chemokines	RN
Fri	05/10/2007	11:00-13:00	Lymphoid organogenesis	RN
Mon	08/10/2007	09:30-10:45	Mol Biol	RN/GG
Mon	08/10/2007	14:00-17:00	Nature of Immunity & Immunopathology	MT
Tue	09/10/2007	09:30-10:45	Mol Biol	RN/GG
Wed	10/10/2007	09:30-10:45	Mol Biol	RN/GG
Thu	11/10/2007	09:30-10:45	Mol Biol	RN/GG
Fri	12/10/2007	09:30-10:45	Mol Biol	RN/GG
Fri	12/10/2007	11:00-13:00	TUTORIAL: Innate immunity	JAG
Mon	15/10/2007	09:30-10:45	Clonal Selection	DIS
Tue	16/10/2007	09:30-10:45	Ag-Ab Interactions	DIS
Wed	17/10/2007	09:30-10:45	Ig structure I	DIS
Thu	18/10/2007	09:30-10:45	Ig structure II	DIS
Thu	18/10/2007	14:00-17:00	Literature searching	AF
Fri	19/10/2007	11:00-13:00	TUTORIAL: Concentrations & Dilutions	GG
Fri	19/10/2007	14:00-17:00	Literature searching	AF
Mon	22/10/2007	09:30-10:45	Immunoglobulin Genetics I	DIS
Tue	23/10/2007	09:30-10:45	Immunoglobulin Genetics II	DIS
Wed	24/10/2007	09:30-10:45	Ig Biosynthesis I	DIS
Wed	24/10/2007	11:00-12:15	Ig Biosynthesis II	DIS
Thu	25/10/2007	09:30-10:45	Complement I	CMcS
Fri	26/10/2007	09:30-10:45	Complement II	CMcS
Fri	26/10/2007	11:00-13:00	TUTORIAL: Molecular Biology	GG
Mon	29/10/2007	09:30-10:45	Fc Receptors	AM
Tue	30/10/2007	09:30-10:45	Cell surface molecules I	MMH
Wed	31/10/2007	09:30-10:45	Cell surface molecules II	MMH
Thu	01/11/2007	09:30-10:45	Interpretation of Scientific Data I	AMM
Fri	02/11/2007	09:30-10:45	Interpretation of Scientific Data II	AMM

Mon	05/11/2007	09:30-10:45	MHC/Genetic control of Immune Response I	MMH
Tue	06/11/2007	09:30-10:45	Interpretation of Scientific Data III	AMM
Wed	07/11/2007	09:30-10:45	MHC/Genetic control of Immune Response II	MMH
Thu	08/11/2007	09:30-10:45	Signal Response coupling I	MMH
Fri	09/11/2007	09:30-10:45	Signal Response coupling II	MMH
Fri	09/11/2007	11:00-13:00	TUTORIAL: Antibodies	DIS
Mon	12/11/2007	09:30-10:45	Signal Response coupling III	MMH
Tue	13/11/2007	09:30-10:45	Cell Cycle Control, Apoptosis and cell death	GG
Wed	14/11/2007	09:30-10:45	Intracellular compartments	RN
Wed	14/11/2007	11:00-13:00	TUTORIAL: Interpretation of scientific data	AMM
Thu	15/11/2007	09:30-10:45	Endocytosis/phagocytosis	RN
Fri	16/11/2007	09:30-10:45	Cytoskeleton, cell locomation	GG
Mon	19/11/2007	09:30-10:45	Nature and Properties of T Lymphocytes	AMM
Tue	20/11/2007	09:30-10:45	CD4+ T cell subsets and cytokines	FYL
Wed	21/11/2007	09:30-10:45	CD4+ T cells and germinal centre reactions	FYL
Wed	21/11/2007	11:00-12:15	Lymphocyte Recircuation	AMM
Thu	22/11/2007	09:30-10:45	Antigen processing and APC	AMM
Fri	23/11/2007	09:30-10:45	Antigen Recognition and Activation of T Lymphocytes 1	AMM
Fri	23/11/2007	11:00-13:00	TUTORIAL: Cell biology	RN
Mon	26/11/2007	09:30-10:45	Antigen Recognition and Activation of T Lymphocytes 2	AMM
Tue	27/11/2007	09:30-10:45	Antigen Recognition and Activation of T Lymphocytes 3	AMM
Wed	28/11/2007	09:30-10:45	Antigen Recognition and Activation of T Lymphocytes 4	AMM
Thu	29/11/2007	09:30-10:45	CD8 T cells and NK/CTL	AMM
Fri	30/11/2007	09:30-10:45	Non Classical T Cells	AMM
Fri	30/11/2007	11:00-13:00	TUTORIAL: MHC/Signalling	MMH
Mon	03/12/2007	09:30-10:45	T cell ontogeny + tolerance	AMM
Tue	04/12/2007	09:30-10:45	Peripheral Tolerance	AMM
Thu	06/12/2007	09:30-10:45	Apoptosis and cell death	RN
Fri	07/12/2007	09:30-10:45	B cell ontogeny	MMH
Fri	07/12/2007	11:00-13:00	TUTORIAL: Concentrations and Dilutions	GG
Mon	10/12/2007	09:30-10:45	B cells	MMH
Tue	11/12/2007	09:30-10:45	Immunological Memory	RN
Wed	12/12/2007	11:00-13:00	TUTORIAL: T cells	AMM
Thu	13/12/2007	10:00-12:00	Mol Biol TEST	RN/GG
Thu	13/12/2007	14:00-16:00	Feedback session	JAG

SECOND SEMESTER 2007-2008

DAY	DATE	TIME	TOPIC	LECTURER
Mon	07/01/2008	09:30-10:45	Overview of Microbial infection	TE
Tue	08/01/2008	09:30-10:45	Bacterial structure and pathogenicity	KH
Wed	09/01/2008	10:00-12:00	ESSAY	JAG
Thu	10/01/2008	09:30-10:45	Acute vs chronic infection	KH
Thu	10/01/2008	11:00-12:15	Viral structures and life cycles	TE
Fri	11/01/2008	09:30-10:45	Microbial Ags -virulence determinants/ vaccine targets	TE
Fri	11/01/2008	11:00-13:00	TUTORIAL: B cells	MMH
Mon	14/01/2008	09:30-10:45	Host parasite relationship I viral infections	TE
Tue	15/01/2008	09:30-10:45	Host parasite relationship II bacterial infections	TE
Wed	16/01/2008	09:30-10:45	Host parasite relationship III bacterial infections	TE
Thu	17/01/2008	09:30-10:45	Host parasite relationship IV fungal infections	TE
Fri	18/01/2008	11:00-13:00	TUTORIAL: Infection	TE
Mon	21/01/2008	09:30-10:45	Immune response to HIV	TE
Tue	22/01/2008	09:30-10:45	Infections in the immunocompromised host	TE
Wed	23/01/2008	09:30-10:45	Postinfectious autoimmune phenomena	TE
Thu	24/01/2008	09:30-11:30	Immunology of the intestine	AMM
Fri	25/01/2008	11:00-13:00	TUTORIAL: Concentrations and Dilutions	GG
Mon	28/01/2008	09:30-10:45	Leishmaniasis	FYL
Tue	29/01/2008	09:30-10:45	Malaria	PH
Wed	30/01/2008	09:30-10:45	Toxoplasma/intracellular parasites	AFr
Thu	31/01/2008	09:30-10:45	Trypanosomes	RMcC
Fri	01/02/2008	09:30-10:45	Exam techniques	JAG
Fri	01/02/2008	11:00-13:00	TUTORIAL Infection	TE
Mon	04/02/2008	09:30-10:45	Schistosomiasis	PH
Tue	05/02/2008	09:30-10:45	Filarial nematodes	ED
Wed	06/02/2008	09:30-10:45	Gut Nematodes	AFr
Thu	07/02/2008	09:30-10:45	Allergy	CMcS
Fri	08/02/2008	09:30-10:45	Hypersensitivity reactions	CMcS
Fri	08/02/2008	11:00-13:00	TUTORIAL Parasitology	RMcC
Fri	15/02/2008	09:30-12:30	CLASS EXAM	JAG
Tue	19/02/2008	09:30-10:45	Chronic Inflammation	CMcS
	19/02/2008	11:00-12:15	Lung Immunology I	CMcS
Tue	19/02/2008	14:00-17:00	MACS	DX
Wed	20/02/2008	09:30-10:45	Lung Immunology II	NT
Thu	21/02/2008	11:00-13:00	TUTORIAL: Allergy & Hypersensitivity	CMcS
Fri	22/02/2008	09:30-10:45	Immunodeficiency I	MT
Fri	22/02/2008	11:00-12:15	Immunodeficiency II	MT

Mon	25/02/2008	09:30-10:45	Transfer of immunity	DIS
Tue	26/02/2008	09:30-10:45	Tumour Biology	GG
Thu	28/02/2008	09:30-10:45	Leukaemia	EF
Fri	29/02/2008	09:30-10:45	Stem cell transplantation	PS
Fri	29/02/2008	11:00-13:00	Xenotransplantation	PS
Fri	29/02/2008	11:00-13:00	TUTORIAL Clinical immunology	MT
DAY	DATE	TIME	TOPIC	LECTURER
Mon	03/03/2008	09:30-10:45	Vaccination and immune potentiation I	DIS
Tue	04/03/2008	09:30-10:45	Vaccination and immune potentiation II	DIS
Wed	05/03/2008	09:30-10:45	Organ specific autoimmunity	IBM
Thu	06/03/2008	09:30-10:45	non-organ specific autoimmunity	IBM
Fri	07/03/2008	09:30-10:45	Transplantation Immunology I	JAG
Fri	07/03/2008	11:00-13:00	TUTORIAL: Respiratory disease	CMcS
Mon	10/03/2008	09:30-10:45	Transplantation Immunology II	JAG
Tue	11/03/2008	09:30-10:45	Tumour Immunology I	AFr
Wed	12/03/2008	09:30-10:45	Tumour Immunology II	AFr
Thu	13/03/2008	09:30-11:00	Feedback Session	JAG
Thu	13/03/2008	11:00-13:00	TUTORIAL: Tumour biology	GG
Mon	07/04/2008	11:00-13:00	TUTORIAL:Protective immunity	AMM
Tue	08/04/2008	11:00-13:00	TUTORIAL: Vaccines and adjuvants	DIS
Wed	09/04/2008	10:00-12:00	ESSAY	JAG
Thu	10/04/2008	11:00-13:00	TUTORIAL: Transplantation	JAG
Fri	11/04/2008	11:00-13:00	TUTORIAL: Tumour immunology	AFr
Mon	14/04/2008	11:00-13:00	TUTORIAL: Problem solving/STATS	AMM

LABORATORY PRACTICAL SESSIONS

FIRST SEMESTER

DAY	DATE	TIME	TOPIC	LECTURER
Thu	04/10/2008	14:00-17:00	In the lab basics	JAG
Wed	10/10/2007	14:00-17:00	Histology and lymphoid structure Lymphoid Anatomy	AMM
Thu	11/10/2007	14:00-17:00		AMM
Mon	29/10/2007	11:00-13:00	Immunochemistry	DIS
Mon	29/10/2007	14:00-17:00		DIS
Tue	30/10/2007	11:00-13:00		DIS
Tue	30/10/2007	14:00-17:00		DIS
Wed	31/10/2007	11:00-13:00		DIS
Wed	31/10/2007	14:00-17:00		DIS
Thu	01/11/2007	14:00-17:00		DIS
Fri	02/11/2007	14:00-17:00		DIS
Tue	06/11/2007	11:00-13:00		DIS
Tue	06/11/2007	14:00-17:00	DIS	
Wed	07/11/2007	11:00-13:00	DIS	
Mon	12/11/2007	14:00-17:00	Complement assays	DIS
Tue	13/11/2007	14:00-17:00		DIS
Mon	19/11/2007	11:00-12:30	Mol Biol lab-PCR Mol Biol lab-PCR gel Restrict & Ligat, restriction mapping	RN/GG
Mon	19/11/2007	14:00-16:30		RN/GG
Tue	20/11/2007	13:00-16:00		RN/GG
Mon	26/11/2007	13:00-15:00	Transformations set up cultures	RN/GG
Tue	27/11/2007	14:00-16:00		RN/GG
Mon	03/12/2007	11:00-13:30	Miniprep, run gel Sequence analysis and database mining	RN/GG
Wed	05/12/2007	11:00-13:00		RN/GG

SECOND SEMESTER

DAY	DATE	TIME	TOPIC	LECTURER
Mon	14/01/2008	11:00-13:00	Cellular Immunology	AMM
Mon	14/01/2008	14:00-17:00		AMM
Tue	15/01/2008	14:00-17:00	FACS/Cell Sorting	JAG
Wed	16/01/2008	11:00-13:00	Cellular/FACS analysis	JAG
Wed	16/01/2008	14:00-17:00		JAG
Thu	17/01/2008	11:00-13:00	Cytokine ELISA	JAG
Thu	17/01/2008	14:00-17:00		JAG
Wed	23/01/2008	14:00-17:00	Phagocyte function	TE
Thu	24/01/2008	14:00-17:00	Phagocyte function	TE

Fri	25/01/2008	14:00-17:00	Data analysis	AMM
Tue	29/01/2008	11:00-13:00	APC phenotype and Function	JAG
Tue	29/01/2008	14:00-17:00	APC phenotype and Function	JAG
Wed	30/01/2008	11:00-13:00	APC phenotype and Function	JAG
Wed	30/01/2008	14:00-17:00	APC phenotype and Function	JAG
Thu	31/01/2008	11:00-13:00	APC phenotype and Function	JAG
Thu	31/01/2008	14:00-17:00	APC phenotype and Function	JAG
Mon	04/02/2008	11:00-13:00	Cytotoxicity assays	AMM
Mon	04/02/2008	14:00-17:00	Cytotoxicity assays	AMM
Tue	05/02/2008	11:00-13:00	Cytotoxicity assays	AMM
Thu	07/02/2008	14:00-17:00	Lab Technology	GG
Tue	19/02/2008	14:00-17:00	MACS	DX
Wed	20/02/2008	14:00-17:00	Lymphocyte function in vivo	MMH
Thu	21/02/2008	14:00-17:00	Lymphocyte function in vivo	MMH
Fri	22/02/2008	14:00-17:00	Lymphocyte function in vivo	MMH
Mon	25/02/2008	14:00-17:00	Lymphocyte function in vivo	MMH
Tue	26/02/2008	14:00-17:00	Lymphocyte function in vivo	MMH
Wed	27/02/2008	14:00-17:00	Lymphocyte function in vivo	MMH
Thu	28/02/2008	14:00-17:00	Lymphocyte function in vivo	MMH