



UNSW
THE UNIVERSITY OF NEW SOUTH WALES

FACULTY OF MEDICINE

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF PHARMACOLOGY

PHAR2012

INTRODUCTORY PHARMACOLOGY AND TOXICOLOGY

COURSE OUTLINE

SESSION 2, 2012

CONTENTS

| | |
|--|----|
| PHAR2011 COURSE INFORMATION | 3 |
| UNITS OF CREDIT (UOC) | 3 |
| PREREQUISITES | 3 |
| OBJECTIVES OF THE COURSE | 3 |
| COURSE CO-ORDINATORS | 3 |
| LECTURERS IN THIS COURSE..... | 3 |
| COURSE STRUCTURE AND TEACHING STRATEGIES | 4 |
| APPROACH TO LEARNING AND TEACHING | 4 |
| STUDENT LEARNING OUTCOMES | 4 |
| ASSESSMENT PROCEDURES | 5 |
| TEXTBOOK AND READING LIST | 6 |
| COURSE EVALUATION AND DEVELOPMENT..... | 6 |
| GENERAL INFORMATION | 6 |
| OFFICIAL COMMUNICATION BY EMAIL | 7 |
| ATTENDANCE REQUIREMENTS..... | 7 |
| BEHAVIOUR IN PRACTICAL CLASSES | 7 |
| CONSENT FORMS..... | 8 |
| NOTICEBOARDS..... | 8 |
| COMPUTING FACILITIES | 8 |
| TEACHING RESOURCES | 8 |
| HANDWRITING..... | 8 |
| MISSED ASSESSMENT ITEMS | 9 |
| MISSED PRACTICAL CLASSES..... | 9 |
| REPEATING STUDENTS | 9 |
| STUDENT RIGHTS AND RESPONSIBILITIES | 9 |
| STUDENT SUPPORT | 9 |
| STUDENT RIGHTS AND RESPONSIBILITIES | 10 |
| APPEAL PROCEDURES | 10 |
| GRIEVANCE RESOLUTION OFFICER..... | 10 |
| PLAGIARISM | 11 |
| LECTURE OUTLINES | 12 |
| PRACTICAL CLASSES | 15 |
| TIMETABLE - INTRODUCTORY PHARMACOLOGY PHAR2011 S2 2012..... | 16 |

PHAR2011 COURSE INFORMATION

UNITS OF CREDIT (UOC)

PHAR 2011 Introductory Pharmacology and Toxicology is a 2nd year Science Course with 6 Unit of Credit (UOC).

PREREQUISITES

Enrolment requirements: 6 UOC level I Mathematics
 6UOC level I Biology (BABS1201 preferred)
 12 UOC level I Chemistry
 6UOC Physiology 1A

(Note: 3992 Medicinal Chemistry students receive a special exemption from requiring Physiology 1A)

OBJECTIVES OF THE COURSE

To gain:

- an understanding of the principles of pharmacology.
- an appreciation of the mechanisms by which drugs act.
- an understanding of the mechanisms by which toxic chemicals disrupt cellular processes.

COURSE CO-ORDINATORS

Course Coordinator:

Dr Lu Liu Room 1505, Mathews building
 Phone: 9385 8762
 Email: Lu.Liu@unsw.edu.au
 Consultation times: by email or phone arrangement

Co-coordinator: Lowy Room 408

Dr Trudie Binder Phone: 9385 8737
 E-mail: W.Binder@unsw.edu.au
 Consultation time: by appointment via email or phone

LECTURERS IN THIS COURSE

Dr. T. Binder W.Binder@unsw.edu.au
Dr. R. Grant R.Grant@unsw.edu.au
Dr. A. Finch A.Finch@unsw.edu.au
Dr. L. Liu Lu.Liu@unsw.edu.au
Dr. N. Jones N.Jones@unsw.edu.au
A. Serobian A.Serobian@unsw.edu.au

COURSE STRUCTURE AND TEACHING STRATEGIES

This 6 UOC consists of:

- 2 lectures per week
- Practical / tutorial sessions of up to 4 hours per week

Lectures: Wednesday 1-2 pm, and Friday 4-5 pm, week 1-12

Tutorials: Thursday 1-2 pm, or Friday 11-12 noon, or 1-2 pm, or 2-3 pm

Practicals: Monday 10 am – 1 pm, or 2 – 5 pm

You are expected to attend all scheduled activities for the full duration. You are reminded that UNSW recommends that a 6 UOC course should involve about 125-150 hours of study and learning activities. Apart from the formal learning activities you are strongly recommended to do your own studies throughout the semester.

Lectures will provide you with the concepts and theory essential for understanding Introductory Pharmacology. To assist in the development of research and analytical skills practical classes and tutorials will be held. As these classes are relatively small they allow you to engage in a more interactive form of learning than is possible in the larger class lectures. The skills you will learn in practical classes are relevant in your development as professional scientists.

APPROACH TO LEARNING AND TEACHING

The learning and teaching philosophy underpinning this course is centred on student learning and aims to create an environment, which interests, challenges, and enthuses students. The teaching is designed to be relevant and engaging in order to prepare students for future careers.

The primary source of information for this course is the lecture material, and the tutorials and practical classes will be directly related to the lectures. Nevertheless, effective learning can also be enhanced through self directed use of other resources such as textbooks, literature references and web based sources. Your practical classes will be directly related to the lectures and you are advised to prepare for practical classes before attendance. It is up to you to ensure you perform well in each part of the course; preparing for classes; completing assignments; studying for exams and seeking assistance to clarify your understanding. Past exam questions are provided to assist you in preparing for examinations.

This course will be parallel taught with Pharmacology for Health and Exercise Science PHAR2211.

STUDENT LEARNING OUTCOMES

A) Discipline specific learning outcomes

On completion of this subject students will be able to:

- Apply pharmacological approaches to problem solving
- Participate effectively in group work
- Apply quantitative analysis to pharmacological data
- Organise information into a clear report
- Have gained a basic knowledge of Pharmacology exemplified by the themes: How Drugs work; Autonomic Pharmacology; The use of Drugs; Alternative Sources of Drugs and Drug handling by the body.

B) Skills based learning outcomes

Underlying PHAR2011 will be an emphasis on Graduate Attributes which include the skills, qualities, understanding and attitudes that promote lifelong learning that students should acquire during their university experience.

- Research, inquiry and analytical thinking abilities
- The capability and motivation for intellectual development
- Ethical, social and professional understanding
- Effective communication
- Teamwork, collaborative and management skills
- Information Literacy – the skills to locate, evaluate and use relevant information.

ASSESSMENT PROCEDURES

| | % total marks |
|------------------------------------|----------------------|
| Mid-session test (40 min duration) | 15% |
| Assignment | 15% |
| Practical report | 5% |
| Online quiz | 5% |
| Final exam (2 hours duration) | 60% |

The progress examination [mid-session test] will be held during the session on the 31st of August. This exam will give you feedback on how you are succeeding in the course. The test will consist of 20 multiple choice questions and will be based on the material covered in the lectures, practical classes and tutorials. Material covered prior to the progress exam may be again examined in the final exam.

The written assignment task will allow you to develop your research, information literacy, communication and time management skills. Your assignment must be submitted electronically via Blackboard, through Turnitin and a hard copy submitted to G7, Biosciences Building. A penalty of 10% per day will apply for late submissions.

The practicals and tutorials are provided to support lecture material and practise analytical skills. The practical classes and tutorials help you to develop graduate attributes. During the practical course you will be required to submit a written report for one of the practical sessions. The report will be due two weeks after the relevant practical class and instructions and marking criteria will be distributed during the practical.

The Online Quiz is a formative assessment, which is created to help you revise the teaching contents and become familiar with the multiple-choice format. You will receive feedback in week 5.

The end of session examination will be held during the official examination period. The examinable material consists of what is covered in lectures, tutorials and practicals classes.

TEXTBOOK AND READING LIST

Prescribed textbook:

- Rang and Dale's pharmacology. 6th ed. Churchill Livingstone/Elsevier.

Recommended textbooks:

- Goodman and Gilman's the pharmacological basis of therapeutics. 12th ed. McGraw-Hill Companies, c2011. (The e-book is available through UNSW Library Resources database).
- Katzung et al., Basic and Clinical Pharmacology. 12th ed. McGraw-Hill. (The e-book is available through UNSW Library Resources database).

All textbooks are available from the UNSW Bookshop

COURSE EVALUATION AND DEVELOPMENT

Each year feedback is sought from students about the courses offered in the Department of Pharmacology and continual improvements are made based on this feedback. The Course and Teaching Evaluation and Improvement (CATEI) Process of the UNSW is the way in which student feedback is evaluated and significant changes to the course will be communicated to subsequent cohorts of students. Also a staff-student liaison group will be set up and students will be invited to become class representatives to seek feedback from their colleagues and meet with academic staff to discuss any issues that arise. Improvements to PHAR2011 have been made based on feedback given last year, including an increase in tutorials and modification of the lecture content.

GENERAL INFORMATION

The Department of Pharmacology is part of the School of Medical Sciences and is within the Faculty of Medicine. It is located in the Wallace Wurth building. General inquiries can be made at the BABS.SOMS.BEES (B.S.B.) Student Office, located on the Ground Floor Room G27, of the Biosciences Building. Office hours are 9.00 am - 5:00pm.

Professor Margaret Morris is Head of Department of Pharmacology. Appointments with Prof Morris may be made through her Administrative Assistant Chris Riordan (C.Riordan@unsw.edu.au) in Room G3 Wallace Wurth.

School Vacation Scholarships: The School of Medical Sciences supports several summer vacation scholarships each year to enable good students to undertake short research projects within the school. For further details contact the Administrative Officer.

Honours program There are two honours programs within the School of Medical Sciences (SOMS), the SOMS Honours Program and the Neuroscience Honours Program. The SOMS Honours Program is currently coordinated by Dr Patsie Polly (patsie.polly@unsw.edu.au; Ph: 9385 2924), and Dr. Richard Vickery, is the co-coordinator for Neuroscience Honours (richard.vickery@unsw.edu.au, Ph: 9385 1676). Medical students may take a year out of the medical course to undertake an Honours program. This is normally done between the 3rd and 4th year of the course.

Any students considering an Honours year should discuss the requirements with the Honours co-ordinator. Outstanding students may be considered for scholarships offered by the University and School and these are offered annually.

Postgraduate research degrees: The Department of Pharmacology offers students the opportunity to enter into **Doctorate (Ph.D)** and **Masters**. For further information contact the co-ordinator, A/Professor Pascal Carrive (p.carrive@unsw.edu.au)

The School Teaching Administrator

Ms Carmen Robinson is able to provide additional information on any courses offered by the School. Student enquires counter, located on the Ground Floor of the Biosciences building (G27). Ph: 9385 2464. Email: Carmen.Robinson@unsw.edu.au

OFFICIAL COMMUNICATION BY EMAIL

All students in the course PHAR2011 are advised that e-mail is now the official means by which the School of Medical Sciences at UNSW will communicate with you. All e-mail messages will be sent to your official UNSW e-mail address (e.g. z1234567@student.unsw.edu.au) and, if you do not wish to use the University e-mail system, you **MUST** arrange for your official mail to be forwarded to your chosen address. The University recommends that you check your mail at least every other day. Facilities for checking e-mail are available in the School of Medical Sciences and in the University library. Further information and assistance is available from IT Service Centre, ph. 9385 1333. <http://www.it.unsw.edu.au/index.html>

Email etiquette: All email communication should be in formal English; students should provide their name, student number and course code.

ATTENDANCE REQUIREMENTS

Attendance at practical classes is compulsory, and must be recorded in the class roll ON THE DAY OF THE CLASS. It is your responsibility to ensure that the demonstrator records your attendance and no discussions will be entered into after the completion of the class. Satisfactory completion of the work set for each class is essential. It should be noted that non attendance for other than documented medical or other serious reasons, or unsatisfactory performance, **for more than 1 practical class during the session** may result in an additional practical assessment exam or ineligibility to pass the course.

BEHAVIOUR IN PRACTICAL CLASSES

The practical class is an opportunity for students to develop graduate attributes by behaving in an ethical, socially responsible and professional manner within the practical class.

- Punctual arrival is expected
- Turn off mobile phones before entering the class
- Enclosed shoes are compulsory for all practical classes. Lab coat must be worn for wet labs.

Information on relevant Health and Safety policies and expectations will be provided in the practical notes, as outlined at:

http://www.ohs.unsw.edu.au/ohs_policies/index.html

Students must take due care with biological and hazardous material and make sure all equipment is left clean and functional. Those who don't adhere to these basic laboratory rules will be marked absent. Special attention should be paid to any precautionary measures recommended in the notes. If any accidents or incidents occur they should be reported immediately to the demonstrator in charge of the class who will record the incident and recommend what further action is required.

CONSENT FORMS

Practical classes involving your participation as a subject require you to sign a witnessed, informed consent form.

NOTICEBOARDS

Noticeboards for this course can be found on the 2nd floor of the Wallace Wurth building. Current timetables and information relevant to you will be displayed here and on Blackboard. It is your responsibility to check these regularly.

COMPUTING FACILITIES

Computer facilities may be available to students in Rooms G2/G4, 106/108, and 109/110 of Wallace Wurth Building. A multiple choice bank of questions is available for student revision. Access may be obtained by taking your student card to Facilities Management (Mathews Building F23, Level 2). Your student card will then allow you to operate the security lock on the door. Hours of access are 8:30am - 6:00pm. However, priority is given to scheduled classes and meetings. NB: The School would like to advise you that a record is kept of students entering the computer facility. Students will be held responsible for any damage.

TEACHING RESOURCES

The Department of Pharmacology has chosen to use the University's central Blackboard service to provide teaching materials for all of its courses.

- To access these materials, either point your browser to the TeLT gateway (<http://telt.unsw.edu.au/>) or go to the School's home page at: <http://medicallsciences.med.unsw.edu.au/> then select "Current Students" from the menu bar and click on UNSW Blackboard Learning, under "Quicklinks" in the left column.
- Log in using your zPass (zStudentNo. and password).
- After logging on to Blackboard, look for the course PHAR2011. You should have access to it if you are properly enrolled.

You can make use of Lectopia (formerly ilectures) recordings taken of the lectures that are available on Blackboard. Lecture notes will also be made available on Blackboard before each lecture. It is recommended that students print these out and bring them to the lecture, so they can annotate them and make their additional own notes during the lecture.

HANDWRITING

Students whose writing is difficult to understand will disadvantage themselves in their written assessment. Make every effort to write clearly and legibly. Do not use your own abbreviations.

SPECIAL CONSIDERATION

Please note the following statement regarding Special Consideration.

*If you believe that your performance in a course, either during session or in an examination, has been adversely affected by sickness or for any other reason, you should notify the Registrar and ask for special consideration in the determination of your results. Such requests should be made as soon as practicable after the problem occurs. **Applications***

made more than three days after an examination in a course will only be considered in exceptional circumstances.

*When submitting a request for special consideration you should provide all possible supporting evidence (eg medical certificates) together with your registration number and enrolment details. Consideration request forms are available from Student Central. In exceptional circumstances further assessment may be given. **If you believe you might be eligible for further assessment on these grounds, you should contact the Course Coordinator as soon as possible.***

MISSED ASSESSMENT ITEMS

If in any circumstances you unavoidably miss the final exam, mid session test or cannot hand in an assessment task on time, **you must inform the course coordinator and you must lodge a special consideration request**, supported by a medical certificate or other documentation to Student Central (see web address above) within **3 DAYS**.

Your request for consideration will be assessed and a deferred exam may be granted. You cannot assume you will be granted supplementary assessment.

If necessary, a supplementary final examination will be held **in the week starting 3th December 2012**.

Normally, if you miss an exam (without valid reasons) you will be given an absent fail. If you arrive late for an exam no time extension will be granted. It is your responsibility to check timetables and ensure that you arrive with sufficient time.

MISSED PRACTICAL CLASSES

Students who miss practical classes due to illness or for other reasons must submit a copy of medical certificates or other acceptable documentation to the course coordinator. **Certificates should be lodged no more than 3 days after an absence. Certificates lodged after 3 days will not be accepted.** The following details must be attached: Name, Subject number, Date of the class, Name of class/es missed.

REPEATING STUDENTS

Practical class exemptions may be granted to repeat students but students **must** check with the course co-ordinator whether they have exemption **prior** to their first practical class. All students must be familiar with the material covered in the practical classes.

STUDENT RIGHTS AND RESPONSIBILITIES

Refer to Student Central @:

<https://my.unsw.edu.au/student/resources/Policies.html#StudentResponsibilities&Conduct>

Student equity and diversity issues can be addressed via Student Equity Officers (Disability) in the Student Equity and Diversity Unit (9385 4734).

STUDENT SUPPORT

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course coordinator prior to, or at the commencement of, their course. Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

Contact: Student Equity and Disabilities Unit, Ground Floor of the John Goodsell Building

Tel: +61 2 9385 4734/5434

Email: seadu@unsw.edu.au

Further information for students with disabilities is available at:

www.studentequity.unsw.edu.au

STUDENT RIGHTS AND RESPONSIBILITIES

<https://my.unsw.edu.au/student/resources/Policies.html#StudentResponsibilities&Conduct>

Student equity and diversity issues can be addressed via Student Equity Officers (Disability) in the Student Equity and Diversity Unit (9385 4734).

APPEAL PROCEDURES

Details can be found at MyUNSW via the Student Central link.

<https://my.unsw.edu.au/student/academiclife/StudentCentralKensington.html>

GRIEVANCE RESOLUTION OFFICER

In case you have any problems or grievances about the course, you should try to resolve it with the Course Organizer (Dr. Lu Liu ph:9385 8762) or the Head of Department (Prof Margaret Morris ph: 9385 1560). If the grievance cannot be resolved in this way, you should contact the School of Medical Sciences Grievance Officer, Dr P.Pandey (9385 2483, P.Pandey@unsw.edu.au).

PLAGIARISM

The School of Medical Sciences will not tolerate plagiarism in submitted written work. The University regards this as academic misconduct. Evidence of plagiarism in submitted assignments, etc. will be thoroughly investigated and may be penalised by the award of a score of zero for the assessable work. Evidence of plagiarism may result in a record being made in the Central Plagiarism Register and the Faculty Students Ethics Officer being notified.

What is Plagiarism?

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

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†
- For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.
- Knowingly permitting your work to be copied by another student may also be considered to be plagiarism.
- Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.
- The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does *not* amount to plagiarism.
- The Learning Centre website is the main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via: www.lc.unsw.edu.au/plagiarism

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

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

Individual assistance is available on request from The Learning Centre.

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

* Based on a document proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle

† Adapted with kind permission from the University of Melbourne.

LECTURE OUTLINES

The course is divided into 5 main themes and will cover:

1. How drugs work
2. Autonomic pharmacology
3. The use of drugs
4. Alternative sources of drugs
5. Drug handling by the body

1. HOW DRUGS WORK

History of Pharmacology

This lecture will provide a brief overview of the development of pharmacology throughout the ages. It includes, medications used by ancient civilizations, Materia Medica, early drug preparation, drug sources and storage, the birth of modern science and pharmacology, examples of drugs developed from plants, adverse reactions, and drug regulations.

Sites of Drug action: Dose Response

This lecture provides an introduction to pharmacodynamics – what the drug does to the body; it includes: receptors, affinity and efficacy, side effects, desensitisation, up and down regulation, quantitation of drug-receptor interactions, dose-response curves, ED₅₀, and spare receptors.

Agonists and Antagonists

This lecture explores competitive antagonism, irreversible antagonism, functional (physiological) antagonism, chemical antagonism, the concept of tone, potentiation, partial agonist, quantitative response, quantal response, therapeutic ratio and indirectly acting drugs.

Introduction to Receptors

A cell responds to its environment by receiving signals. These signals are received by proteins, known as receptors, which in turn transmit the signal within the cell (this process is termed receptor or cell signalling). Receptors allow the body to detect not only what is happen in the outside world (eg taste, sight, sound, touch) but also what is happening within the body (eg blood pressure, heart rate, glucose metabolism). Receptors can be found either on the cell surface or in intracellular compartments. The main cell surface and intracellular receptor families will be covered

Receptor Signalling

Receptor signalling is the process whereby a receptor relays the stimulus imparted by the binding of the ligand. This often involves a sequence of events mediated by second messengers inside the cell. Calcium's role as a second messenger will be explored. To maintain homeostasis within the cell the termination of signalling must also occur. The role of phosphorylation in signal termination will be covered.

Regulation of Neurotransmitters

This lecture will cover the basic aspects of synthesis, storage and release of monoamines (serotonin, dopamine and noradrenaline) and also cover pathways involved in metabolism and reuptake. In addition, the manipulation of neurotransmitter activity as effective strategies for alleviating various diseases and/or their symptoms will be discussed.

2. AUTONOMIC PHARMACOLOGY

Introduction to Autonomic Pharmacology

Introduction to the autonomic nervous system (ANS), i.e. the parasympathetic and sympathetic nervous systems. The integrative action of the ANS. The cholinergic and adrenergic neurotransmissions. Cholinergic and adrenergic receptor classifications.

Cholinergic Mechanisms

Introduction to 3 classes of cholinergic agents: Muscarinics, Nicotincs and Anticholinesterases. Representative agents of each class, mechanisms of action, clinical uses, side effects and contraindications. The action of Botulinum toxin in inhibiting cholinergic exocytosis and its clinical uses will also be discussed.

Adrenergic Mechanisms

Catecholamines. Synthesis and Metabolism of Catecholamines. Adrenergic receptors. Alpha-1 adrenergic agonists and antagonists. Alpha-2 adrenergic agonists and antagonists. Beta adrenergic agonist and antagonists. Indirectly acting sympathomimetic amines.

3. THE USE OF DRUGS

Drugs of Addiction

This lecture encompasses drug dependence and abuse. Patterns of drug use in Australia. Why take drugs? Reward, pleasure and addiction. How drugs act at a cellular level; tolerance, dependence and withdrawal. Different classes of Drugs: Opioids, Alcohol, Stimulants, Cannabis, Hallucinogens, Nicotine.

Peptic Ulcer

Introduction to current views on pathogenesis of peptic ulcer focussing on *Helicobacter pylori*. Factors contributing to *H. pylori*-related gastric pathology; clinical symptoms of gastroduodenal ulcers and diagnostic tests; pharmacological treatment options: e.g. proton pump inhibitors (PPI); histamine H₂ blockers, antacids, combination of antibiotics and PPI.

Anti-inflammatory Drugs

Inflammation is the response of the body to invasion by a pathogen (infection) or injury, This lecture will provide an overview of the therapeutic strategies to treat inflammation. The lecture encompasses eicosanoid biosynthesis, NSAIDs, paracetamol and DMARDs, including their mechanism of action.

Drugs and Disease: Asthma

This lecture introduces drug treatment and disease, using asthma as an example. Treatments for asthma and associated pharmacology. Bronchial asthma, inflammatory cells and mediators, commonly used anti-asthmatic drugs [β -adrenergic agonists, xanthines, glucocorticoids, oral steroids]. Asthma management, treatment of severe acute asthma, viral infections, novel treatments for asthma.

Drugs and Disease: Anti-malarials

Malaria remains one of the world's most devastating human infections. This lecture will explore the pharmacological management of Malaria including treatment options, adverse effects and contraindications.

4. ALTERNATIVE SOURCES OF DRUGS

Alternative Medicine

Alternative medicines describes the use of, generally plant or animal based, preparations not currently established as conventional therapeutic treatments. This lecture will briefly discuss the role of alternative medicines in healthcare and identify key elements for a reasonable evaluation of their use.

Neutraceuticals

The therapeutic effects or side effects of a medication can affect nutritional status. Conversely, diet nutrient supplementation or nutritional status can decrease a drug's efficacy or increase its toxicity. Failure to identify and properly manage drug-nutrient interactions can lead to serious consequences. This lecture outlines drug / nutrient interactions including alterations in pharmacodynamics and pharmacokinetics, the effect of food on drug therapy and the effect of drugs on food and nutrition.

5. DRUG HANDLING BY THE BODY

Drug Chemistry & Absorption

Acidic, basic and neutral drugs; relationship between lipid solubility and ionization; characteristics of transfer of drugs across cell membranes, passive diffusion, active transport.

Drug Metabolism

Drug absorption and pathways of metabolism of drugs leading to either inactive or active metabolites. Contribution of Phase 1 (oxidative) and Phase II (conjugative) pathways to drug metabolism. Factors affecting drug metabolism - other drugs (induction, inhibition), age, disease states, genetic factors. Polymorphic drug metabolism and its consequences. Renal secretion of drugs affecting secretion. Effects of other drugs, protein binding, pH and age on renal elimination. Renal dysfunction and drug elimination.

Toxicology

Introduction to toxicology and the mechanisms by which chemicals elicit adverse effects in the human body; toxicokinetic and toxicodynamic aspects and their clinical relevance. Natural toxins, animal and plant, their pathophysiological effects and treatment.

Toxic Effects of Drugs

This lecture will cover the basic definition of drug toxicity and will introduce the concept of the Therapeutic Index (TI). The causes for different individual responses to drugs (risk factors for drug toxicity) will be outlined. Major toxic reactions to common drugs including the mechanism of disease and primary treatment options will be discussed.

Future of Pharmacology: New Drug Targets

What does the future hold for pharmacology? Will the majority of drugs still target membrane receptors? Has reading the human genome lead to the identification of new drug targets? What will be role of "omics" in drug discovery? Is the 21st century the era of personalised medicine? What role will antibodies and gene therapy play in medicine of the future? All these questions and more will be covered as we look into pharmacology's crystal ball.

PRACTICAL CLASSES

Practical 1. Concentration Response: Agonists

Practical 2. Concentration Response: Antagonists

Practical 3. Drugs and the Eye

Practical 4. Identification of Unknown Drugs

Practical 5. Drug Excretion: Aspirin

PREFACE

Students are required to familiarise themselves with the appropriate section of the practical manual before attending each class.

Students are also required to wear a laboratory coat to all classes other than computer based classes.

In the interests of safety, special attention should be paid to any precautionary measures recommended in the notes. If any accidents or incidents occur they should be reported immediately to the demonstrator in charge of the class who will record the incident and recommend what further action is required.

Animal Experimentation

The procedures used in the laboratory classes involving the use of animals have been approved by Animal Care and Ethics Committee (registration number ACEC 10/71A). All experiments undertaken in the Department of Pharmacology adhere to the NHMRC code of conduct for animal experimentation.

Human Experimentation

Experiments in this manual which involve the use of human subjects have been considered and approved by the University's Committee on Experimental Procedures Involving Human Subjects [HREC10268 and HREC11269]. Each student must read carefully the details of each experiment before embarking on it, and is required to raise any matters of concern with the person in charge of the class before the experiment has begun.

Students volunteering to act as subjects in practical classes will be required to sign witnessed informed consent forms. Forms will be distributed and collected in the practical classes.

TIMETABLE - INTRODUCTORY PHARMACOLOGY PHAR2011 S2 2012

| Wk | Date | Practical: WW 202/204 Monday | Lecture 1: CLB7 Wednesday 1-2 pm | Lecture 2: Rex Vowels Friday 4-5 pm | Tutorials Thursday & Friday | |
|----|------|---|---|--|---|--|
| 1 | 16/7 | Orientation to Practicals (all students) | Introduction & History of Pharmacology Liu / Binder | Sites of Drug Action: Dose Response T. Binder | | |
| 2 | 23/7 | Concentration Response: Agonists Liu / Binder / Burcher | Agonists and Antagonists T. Binder | Introduction to Receptors A. Finch | Essay Writing Skills Liu / tutors | |
| 3 | 30/7 | Concentration Response: Agonists Liu / Binder / Burcher | Receptor Signalling A. Finch | Introduction to Autonomic Pharmacology L. Liu | Pharmacodynamics Binder / tutors | |
| 4 | 6/8 | Concentration Response: Antagonists Liu / Binder | Cholinergic Mechanisms 1 L. Liu | Cholinergic Mechanisms 2 L. Liu | Receptor Signalling Finch / tutors | |
| 5 | 13/8 | Concentration Response: Antagonists Liu / Binder | Regulation of Neurotransmitters Finch / Jones | Adrenergic Mechanisms 1 A. Finch | Cholinergics Liu / tutors | |
| 6 | 20/8 | Drugs and the Eye Liu | Adrenergic Mechanisms 2 A. Finch | Drugs of Addiction T. Binder | | |
| 7 | 27/8 | Drugs and the Eye Liu | Anti-inflammatory Drugs T. Binder | TEST Liu / Binder | Adrenergics Finch / tutors | |
| | 3/9 | MID SESSION BREAK | | | | |
| 8 | 10/9 | Drug Unknown Self directed learning | Drug Chemistry and Absorption R. Grant | Drugs and Disease: Asthma T. Binder | Test Review Liu / Binder | |
| 9 | 17/9 | Drug Unknown Self directed learning | Drug Metabolism R. Grant | Peptic Ulcer L. Liu | Anti-inflammation Drugs Binder / tutors | |
| 10 | 24/9 | Drug Excretion: Aspirin Binder / Grant | Alternative Medicines R. Grant | Anti-malarials A. Serobian | Drug Metabolism Grant / Binder / tutors | |
| 11 | 1/10 | Monday - Public Holiday | Neutraceuticals R. Grant | Toxicology T. Binder | Drugs & Diseases - Case Studies Liu / Binder / Tutors | |
| 12 | 8/10 | Drug Excretion: Aspirin Binder / Grant | Toxic Effects of Drugs N. Jones | Future of Pharmacology: New drug Targets T. Binder | Exam Revision Quiz L. Liu | |

Practicals: Monday 10 - 1 pm even weeks (WW202/204)
Monday 10 - 1 pm odd weeks (WW204/204)
Monday 2 - 5 pm odd weeks (WW204)

Tutorials: Thursday 1-2 pm Mat 102
Friday 11-12 noon Biomed E
Friday 1-2 pm Mat102
Friday 2-3 pm Biomed E