



Pharmacology Part II

Course Handbook 2023 - 2024

Welcome to Pharmacology

Pharmacology is the study of the mechanism of action of drugs on biological systems, whether the drug is synthetic, natural or endogenous. Pharmacology is a multi-disciplinary field, encompassing every level of biological organisation, from atomic structures, signalling pathways, cells, tissues and organisms, to entire populations. Pharmacology lies at the heart of drug discovery, has enormous impact on the practice of medicine and veterinary medicine, and is a vital approach to understanding health and disease. You can expect to encounter the most recent research and the controversies surrounding it.

Part II is very different from Parts IA and IB. With fewer than 100 hours of lectures during the academic year, you will have much greater responsibility for organising your work. This handbook provides the essential information you need to get started, and a summary of what lies ahead. You will probably find it helpful to refer to these notes throughout the year, and many of the queries that arise are likely to be answered within the handbook. You are responsible for knowing and following the information and instructions the handbook contains. You should use the handbook alongside Moodle, where amendments to dates, etc. will be posted. Teaching staff and examiners will also update you by email.

Most of your work will now be based in the Department of Pharmacology, and we hope that you will feel at home and safe in Pharmacology. Whether you are reading Pharmacology or BBS, you have a busy and enjoyable year ahead of you.

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Course Organiser

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The Course

Course Aims

- To provide a wide-ranging, balanced, and critical treatment of pharmacology as it relates to understanding mechanisms of drug action.
- To equip you with a range of skills for your future career, whether it is in life sciences research, medicine, veterinary medicine, drug discovery, or other careers not directly related to pharmacology.

Learning Objectives

By the end of the course, you should be able to:

- Think critically and with an appropriate level of knowledge across a wide range of pharmacological topics.
- Find, critically assess, and integrate information from the scientific literature.
- Understand and critically assess different methods to solve pharmacological problems.
- Communicate effectively with a scientific audience in oral presentations, written reports or dissertations, and essays.
- Analyse and assess research methods and results during a supervised research project (Part II Pharmacology only).

Course structure

The course is taught through lectures, tech and expert talks, discussion groups, supervisions, and study skills workshops. **All of these are shared between Part II Pharmacology and Part II BBS.** The teaching is delivered by staff from the Department of Pharmacology who are all actively engaged in research and committed to teaching excellence, complemented by visitors from other Departments and pharmaceutical companies.

Michaelmas Term

Lectures	In person; Seminar Room, Dept of Pharmacology.
Workshops	Study Skills - Introduction to Drug Review - Library Research skills - Essay-writing - Careers pop-up drop in - Preparing for Dissertations - Data Interpretation - Statistics practical workshop.
Tech & Expert Talks	In person; Seminar Room, Dept of Pharmacology.
Discussion Groups	4 meetings, focussing on critical evaluation, summary, and presentation of published papers.
Supervisions	Arranged individually. All University-based lecturers are available to provide supervisions.
Drug Review	Pharmacology Part II only. You will have the entire term to complete your Review, to be handed in after Christmas. Students will give a short talk on their drug review at the start of Lent Term.
Feedback	Feedback via online questionnaires throughout the course and via course reps at an end of term feedback meeting.

You will choose your project or dissertation topic during Michaelmas Term.

Lent Term

Lectures	In person; Seminar Room, Dept of Pharmacology.
Workshops	Data Interpretation - Revision.
Discussions Groups	4 meetings. These will combine presentations with reviews of progress in projects or dissertations.
Research Project	Pharmacology Part II only. Students are expected to spend about 24 days completing a practical research project in Lent Term. You will meet regularly with your research project supervisor throughout the term.
Dissertation	BBS only. You will have the entire term to complete your dissertation, supplemented by 4 formal meetings with your dissertation supervisor. You will present your dissertation as a 3-minute thesis at the end of Lent Term.
Supervisions	Arranged individually. All University-based lecturers are available to provide supervisions.
Feedback	Feedback via online questionnaires throughout the course and via course reps for an end of term feedback meeting.

Easter Term

There is no formal teaching in the Easter Term, leaving you free to read and revise.

Research Project	Pharmacology Part II only: You will present your research project as a talk to the Part II examiners. The presentation is assessed.
Examinations	Written examination Papers 1-4

Lectures

Lectures cover the full breadth of modern pharmacology, from atomic structures to populations and everything in between. Some lectures will focus on basic sciences, others on clinical application; some will focus on drug action at the molecular and cellular level, while others on better understanding disease to find new drug targets. What unites them is the application of pharmacology to solve biological and clinical problems.

Lectures are an introduction to the topic and an overview of the major areas of interest. You should not see them as exhaustive coverage of a topic or as a series of 'facts' to be learnt and reproduced in an exam. Instead, they should encourage you to research the topic in depth and think about the major unresolved questions in the field.

Note: in previous years the lectures were divided into Systems Pharmacology, and Molecular and Cellular Pharmacology. This arbitrary division has been removed, although you will see it in the past exam papers.

Lectures will be delivered in person. You will receive a maximum of 2 lectures per day, so there is plenty of time to explore specific topics in depth. **You are expected to attend all lectures.** Although the examinations allow a choice of questions, your choice may be severely compromised if you chose to be too selective in your engagement with lectures. You cannot assume that every topic covered in lectures will be included in the exam papers.

Lecture Capture

Recordings of lectures will be uploaded onto the NST Part II and BBS: Pharmacology website within a reasonable time if the lecturer has consented to the recording. Please note The General Board's Education Committee (GBEC) [Guidance to record lectures](#) statement and [Expectation to record lectures 22 - 23 policy](#).

Getting the most out of Part II lectures

Prepare

Read about the subject before the lecture course starts. Review your notes from previous lectures before the next one in each course. This means that you will be ready to identify the key themes and ideas. The learning objectives for the course will also highlight the key themes.

Actively take notes

You should not expect the lengthy handouts provided in Part I courses, therefore you will need to take your own notes. Good notes are not just for later memory but are also an important part of the learning process. Actively taking notes helps you to understand the lectures. Active note-taking summarises the main points and themes of the lectures, rather than attempting to create a verbatim account of the lectures. You should aim to construct a framework of understanding that you can use to organise the information from the lectures and your own reading. Many students find that summary diagrams or mind maps are effective ways of note taking, which is supported by educational research. Active note taking requires active listening, without other distractions. This is particularly important as you watch online lectures in your college room.

Read beyond the lectures

Lecturers will provide reference lists. Many lecturers will suggest which papers are the best place to start. Additional reading is a key difference from Part I: lectures now provide the essential introduction, but it is for you to pursue topics in more detail by selective reading of both the primary and review literature, initially guided by the reference lists. The relatively light schedule of formal lectures is designed to ensure that you have abundant opportunity to read and think in depth.

Think about what you have heard and read and consolidate your thinking. Reflect on the lectures and the papers you have read. Think about the main themes in the lecture topic. What conclusions are supported by the evidence? Is there another way of interpreting the data? What further experiments are needed? Look for connections to other lecture courses. Mind maps or essays plans can help consolidate your notes.

You should treat the material in the lecture courses as examples to answer broader questions:

- How can we develop new drugs for unmet clinical needs? What is the role of pharmacology in developing new drugs? What is the role of academic research in drug development? Should we leave drug development to big pharma?
- To what extent does understanding disease help find new therapeutic targets? To what extent does a clear understanding of the cellular and molecular nature of drug targets help our development of new drugs? Why do patients respond differently to drugs?

Supervisions

All lecturers based at the University can provide supervisions on their lectures. The aims of these supervisions are to answer your questions, give feedback on essays, and discuss the topic in greater detail. The more that you prepare for supervisions, the more you will get from them, so come armed with questions. Lecturers like to run their supervisions in different ways. Some lecturers will expect that you should submit an essay to the lecturer in good time before the supervision. This essay will form the starting point for discussing the topic further. Writing an essay on the topic also helps you to develop your understanding of a topic and highlight questions that you want to discuss. Some lecturers may run question and answer sessions to help you understand their course. Supervisions may be in person or online.

It is your responsibility to arrange the supervisions you want. (You should discuss supervisions with your College Director of Studies and note the Supervisions Norms on Moodle). Supervisions are arranged through an online supervision sign-up system on Moodle. Lecturers will create supervision slots with a maximum group size. The slots will be after the lecture course, to give you time to read, think, and write. You can sign up for free slots on Moodle. The slot description will also indicate whether an essay is required, giving some suggested essays titles and a deadline for submission, or whether this will be a Q&A session.

Some lecturers will be happy to comment on essays without a supervision. You should contact the lecturer directly to arrange this. Lecturers may be unavailable during vacations or during the interview period in December. You should not expect lecturers to mark essays in the 2-3 weeks before exams.

Tech & Expert talks

Tech & Expert talks provide overviews of a variety of advanced techniques used in pharmacology research and the latest developments within the Pharmaceutical industry. Tech Talks are given by senior researchers with first-hand expertise in the techniques, providing essential insight into the methods you will encounter in lectures and reading, and so better prepare you for critical evaluation of published evidence. Expert talks are given by industry leaders and provide an overview of latest clinical development and therapeutic approaches. There are no supervisions associated with Tech & Expert Talks and nor should you expect to have essays marked on these topics. The subject matter is, however, of immediate relevance to examinations – particularly Paper 4 and dissertations/projects. Tech & Expert Talks will be delivered in person and the lecture capture made available online via Moodle where consent has been given. You are expected to engage with all Tech & Expert Talks.

Skills workshops

Skills workshop, seek to develop skills that you will find useful across the entire course, however, none of the materials covered is directly examined. Workshops are often repeated to allow for smaller groups and flexibility for your timetables. The Essay-writing workshop reviews the skills needed to write concisely and with the breadth and depth expected at Part II; it is complemented by Library skills which provides guidance on accessing the literature and dealing with references. There will be workshops to support the Data interpretation paper (paper 4), and introductory sessions to the Drug Review (project students only), the BBS dissertation (BBS students only) and a preparing for projects session (project students only).

Statistical workshops are run by the Bioinformatics Training Facility and are designed to provide you with an understanding of principles behind standard statistical analyses, and their importance to data interpretation. The two-day practical workshop will provide hands on-training in data analysis and is directly relevant to the research project. 'Introduction to R' course materials will be made available to you prior to the statistical workshops; you will need to work through the material at your own pace **before** the statistical workshops. A drop-in session has been arranged to provide asynchronous support for the Introduction to R course material, where you can direct your questions to the Bioinformatics Training Facility. The Statistical workshops will be held in the Bioinformatics Training room at the Craik-Marshall (Downing Site). You can either use the PCs that are available or bring your own laptops. Coffee, tea and biscuits are provided! Project students are expected to attend each day of the workshop; the practical workshop is optional (but advised) for BBS students.

Discussion Groups

You will be allocated to a Discussion Group of around 5 students. The list will be circulated separately. Early in each term, you will agree a timetable for your meetings (four in each of the Michaelmas and Lent Terms). The exact format of the meetings varies between groups, but each seeks to develop presentation skills and the ability to critically evaluate the scientific literature. **You are expected to attend all meetings of your Discussion Group** and the course coordinator will be provided with details of attendance.

Arrangements for the minor subjects (BBS only) differ between subjects. You can obtain further details from the web site. The timetables do not include the minor subject details.

Feedback and student representation

The present course has been shaped in part by the comments of your predecessors. There are three levels at which we encourage current Part II students to provide constructive comments on the course:

1. You can write or speak directly to the Course Organiser. If you have comments that you feel must be submitted anonymously, you should do so via your course representative or College tutor. Note that questions about the examinations should be directly to the Senior Examiner.
2. You can provide feedback via your course representatives. You will elect two course representatives from the current class, one to represent Part II Pharmacology and the other to represent BBS who will attend a feedback meeting with the Course Organiser before the end of Michaelmas and Lent terms to relay feedback on the course from Part II & BBS Pharmacology students. All students are welcome to attend these feedback meetings should they wish to. These meetings will collate comments on the overall course and each lecture series that term. In addition, the course representatives attend meetings of the Department of Pharmacology Teaching Committee (at the end of each term), where they provide input into the more detailed discussions of course reviews, etc. that are considered by the broader Teaching Committee. It is for you to decide on your representatives and to provide the course organiser with the names before the end of October. Dates of the feedback meetings will be circulated during term time.
3. You can provide feedback via Student Surveys. Short surveys will be sent out during term time to capture quantitative feedback on each lecture series. In addition, longer surveys will be circulated at the end of each term to capture broader feedback on aspects of the course in general, working in the Department etc.

We greatly appreciate you taking the time to complete these surveys. Please make use of these opportunities to provide feedback and remember that constructive criticism is most likely to be effective!

We will always try to resolve any course-related problems that you may have. However, if you consider that a complaint has not been resolved, or appropriate action has not been taken, you can initiate a formal complaints process. The University's Student Complaints Procedure can be found at: <http://www.studentcomplaints.admin.cam.ac.uk/student-complaints>.

Examples of recent changes introduced in response to student feedback:

- More diverse exam structure, testing a broader range of skills.
- Smaller discussion groups.
- Online supervision sign-up system introduced to simplify and standardize the process.
- Lecture courses reordered or restructured to make links between courses more apparent.

Drug Review (Part II Pharmacology only)

Choosing the topic for your Drug Review

The list of drugs that you can choose to cover for your review will be issued at the beginning of Michaelmas Term. You must choose a drug from this list. You can choose the same drug as another student, although you should be aware that the examiners will consider unacknowledged collaboration to be plagiarism.

Researching your Drug Review

Your review provides an opportunity to explore a topic in depth. You should aim to provide a wide-ranging, detailed and balanced description of the drug's use(s), its mechanism(s) of action and its development, supported by the available scientific evidence. You should give your own critical appraisal of the evidence. Do not be afraid to suggest your own interpretations.

One of the aims of the Drug Review is to promote your independent research skills. There will be no specialist supervisions on your review. A workshop in Michaelmas Term will help you explore what makes a good review.

Preparing your Drug Review

- **Maximum length:** 2,500 words, excluding title page, lay summary, tables (and table legends), figures (and figure legends), footnotes, bibliography and acknowledgements. You should avoid putting a lot of text in figures, tables or footnotes in an attempt to stretch the word limit. Note that any in-text citations (see 'References', below) are counted as part of the 2,500 words. A contents page is not required. You should not include any appendices.
- **Format:** Drug Reviews must be typed and submitted as a single PDF, named with your CRSid. Your Drug Review should be written in a scientific style and with the evidence supported by references that you have read and critically interpreted. You can include as many figures as you need; you are strongly encouraged to develop the figures yourself. *Note: Biorender is a very useful resource for making original figures (<https://biorender.com/>).*
- **Title Page:** You should include a title page, with the title of your drug review, the word count, Anonymous number (AN). Your Anonymous number will be sent to you from the course administrator at the end of Michaelmas Term. Do not include your name on the title page.
- **Lay summary:** Your Review should begin with a short summary of the major points, written in a style suitable for an intelligent lay person. History suggests that most students fail to write this paragraph in a style that would really be understandable by a lay reader: avoid technical language, but without being patronising. This section is more difficult than you might imagine, so work at it. Non-scientific friends are often the best judge of whether you have judged the level correctly. The limit for this section is 500 words. This really is an upper limit, not a target. A good lay summary is often much shorter than this.
- **References:** A variety of software is available to allow you to manage references. Examples of free software that students have previously found useful are Zotero, Mendeley or Endnote Web. See <https://libguides.cam.ac.uk/clinical-medicine/referencing> for more

details. Unlike your Research Project Report, you can reference in any commonly used style, so long as you are consistent throughout the Review. *Note: if you use the Author-date style, which has, for example (Vane, 1971) in the main text, these in-text citations will count towards your word limit.*

Inadequately acknowledging the work of others is plagiarism. **Both examiners and the general scientific community regard plagiarism as a serious offence.** Where you refer to the work of others (in text or figures), make sure that the original source is fully acknowledged. The electronic version of your dissertation will be assessed in plagiarism-detection software. Further guidance on plagiarism is provided here:

<https://www.plagiarism.admin.cam.ac.uk/>, and in the Faculty Board's statement on plagiarism: <https://www.biology.cam.ac.uk/exams/AllExams/plagiarism>

- **Declaration:** In addition to your Drug Review PDF, you must submit a separate signed declaration on a single page that includes: the drug name, your full name, your College, the drug review word count, the date and a declaration stating: *"I confirm that the material in this drug review, submitted in partial fulfilment of the regulations for NST Part II Pharmacology is not copied from any published material, nor is it a paraphrase or abstract of any published material unless it is identified as such and a full source reference is given. I confirm that, other than where indicated as above, this document is my own work and has not previously been submitted for a similar purpose."*

Submitting your Drug Review

The deadline for submitting your Drug Review will be confirmed by the Senior Examiner closer to the time. (It is likely to be 12.30pm on the first Friday of Lent Term.) You must submit your Drug Review via Moodle as a single PDF (named with your CRSid) together your declaration as a separate document. Your Drug Review will be subject to scrutiny for plagiarism.

Note: In exceptional circumstances, if you think you will be unable to meet the deadline and have good reasons (i.e. illness or other extenuating circumstances) you will need to consult the Senior Examiner and Course Organiser or your College Tutor, who will make a case to the EAMC. Further information can be found at <https://www.educationalpolicy.admin.cam.ac.uk/assessment>

Presenting your Drug Review

You will present a talk on your Drug Review at the start of Lent Term. In previous years, the maximum time limit for presentations has been 5 minutes. The Senior Examiner will confirm the details closer to the time.

Research Projects (Part II Pharmacology only)

Choosing your Research Project

The list of possible research projects is issued in October. Supervisors will be happy to discuss potential projects early in MT. You are not allowed to complete your project in a lab where you have worked previously (e.g., as a summer student). You must choose a project from the circulated list. Please note that the number of projects available is limited and you may not necessarily be allocated your first project choice. You are not allowed to make independent arrangements with supervisors. Most projects are within the research labs of staff of the Department, but on occasion a few projects are based elsewhere (e.g., MRC Toxicology, Clinical Pharmacology, CIMR). Project choices will be made via the submission tool on the NST Part II and BBS: Pharmacology Moodle site in early November. Projects will be allocated based on order of preference.

Before you begin

Once you have been allocated your project, you should discuss the project with your supervisor before the end of Michaelmas Term. Your supervisor is likely to recommend some reading to help you prepare for the project. Make full use of this to ensure that you arrive for your project well prepared – you will then get more out of your project.

Before beginning any laboratory work, **you are required to attend a safety course**. The course is mandatory: you will not be allowed to begin your project unless you attend. Further details of safety issues are provided in later sections.

During your Research Project

You will spend about 3 days per week working on your project (24 days in total). Student access cards will be amended to allow access to their laboratories.

The Lent Term is busy with both lectures (although fewer than in Michaelmas Term) and your research project. You can easily slip into spending too much time on your project to the neglect of reading around lecture materials. Occasionally, supervisors may have unrealistic expectations of the time you are expected to devote to your project. Try to keep to a balanced timetable. If that proves difficult, discuss it with your supervisor in the first instance. The Course Organiser or Head of Department are also available to help. Do seek help if you or your supervisor are finding it difficult to balance the demands of your project with the other components of the course.

It is an essential, and statutory, requirement that your research project be conducted with appropriate attention to health and safety issues. In addition to attending the mandatory safety course (see above), you must also be familiar with the risk assessments relating to your specific project work. You must not work unsupervised in labs outside normal working hours. Your project write-up must include a short discussion of the risk assessments. Further details of health and safety matters are provided later in this handbook.

Note: In case of additional accesses required for laboratory research please contact undergrad@phar.cam.ac.uk to adjust your ID badge.

Preparing your Research Project Report

At the end of your research project, you must submit a written report to the examiners in the style of a published paper. You will also present your project as a talk. The report should be written entirely by the student. Supervisors are permitted to give only general comments and advice on reports. Some reports from previous years are available via Moodle and are useful sources of guidance.

Note: the following requirements were recently revised to encourage concise reports (by imposing a word limit) and to include a lay summary. Some reports from previous years may have been submitted under the older rules.

Research Project Report requirements

- **Maximum length:** 4,000 words, excluding title page, acknowledgements, bibliography, and any appendices, tables, figures legends and footnotes, but including all other text (lay summary, abstract, main text). Note that in-text citations (see 'References', below) are counted as part of the 4,000 words.
- **Format:** Your reports must be typed, double spaced, with 2.5 cm margins, a font size for main body text no larger than 12pt and no smaller than 10pt, and submitted as a single PDF, named with your CRSid.
- **Title Page:** You should include a title page, with the title of your project, supervisor's name, word count and anonymous number (AN). Your Anonymous number will be sent to you from the course administrator at the end of Michaelmas Term. Do not include your name or College on the title page.

Note: It is not possible to completely anonymise the project reports in a small department in which most people will be aware of the work and types of experiments performed by their colleagues. As such the name of supervisor has been included in the title page details. We have taken pragmatic steps to reduce bias in the marking by removing the student's name from the report and we have recommended that students do not include the name of their college or a crest which may allow them to be identified from another student working in the same lab.

- **Acknowledgements:** Immediately after your title page you must acknowledge all sources of help or collaboration (including support from within your college), highlighting the help given. This statement should appear on a page of its own.

Note: Where projects have been carried out in pairs, each student must write an independent report and acknowledge which work was a joint effort. The statement must clearly delineate the contributions of each student. This is extremely important. Examiners must be able to resolve unambiguously the contributions of each student. Where students have worked in pairs but provide separate data to a joint figure, each student must also clearly delineate the contributions of each partner in the figure legend. For example, a figure legend might state: ' The results were collected entirely by AB (panel a), entirely by CD (panel b), with AB and CD working together (panel c) and with two replicates provided by AB and 3 replicates provided by CD (panel d). The analysis shown in panel e was from

data collected by AB and analysed by CD'. It is essential that you provide this information for shared projects (or where others have contributed to your results).

- **Lay summary:** Your report should begin with a single short paragraph (no more than 100 words) summarising the background, results and conclusions written in succinct, easily digestible way suitable for an intelligent lay person. It should not contain specialist details, abbreviations or references and should give readers an idea of the general topic and impact of the research.
- **Abstract:** Your abstract should succinctly summarise your key findings and why your research is important. It should be divided into subheadings: 'Background and Purpose', 'Experimental Approach', 'Key Results', and 'Conclusions and Implications'. Avoid any non-standard abbreviations. The Abstract should be no more than 250 words (including subheadings) and is included in the 4,000 word limit.
- **Main text:** Your report should be written concisely and, in a style like that of a paper in the British Journal of Pharmacology.
 - The **Introduction** should succinctly provide the background information that is required to set the results into their proper biological context.
 - The **Methods** should be written in detail sufficient to allow your experiments to be repeated, and they must include reports of the precautions taken to ensure safe execution of the work.
 - The **Results** section should describe the results of the experiments performed and report your findings. The Results section should be broken up by subheadings to organise the findings presented and walk the reader through the results (It is most helpful if the subheadings indicate the main conclusion of the subsection).
 - The **Discussion** should explain the significance of the results and place them into the broader context of the current literature. Suggestions for further experiments and discussion of project limitations should be included.

Note: Consider carefully whether any abbreviations help. Lists of cryptic abbreviations can be a barrier to understanding for readers from outside your immediate field.

- **Figures:** The first sentence of each figure legend should summarise the figure and be in bold. Each figure legend should stand alone and contain enough information to ensure that the figure is understandable without having to refer to the main text. However, you should not include unnecessary text in figures in an attempt to stretch the word limit. Figure panels should be labelled (A, B, C, etc.), and each panel should be described in the legend. Any abbreviations not given in the main text should be defined. Always include numbers, distinguishing biological and technical replicates. All Figure panels and Tables should be referred to in the text, in order (whether individually or grouped). If you cannot refer to the panels in order in the text, then change the text, or change the order of the panels in the figure.
- **References:** A variety of software is available to allow you to manage references. Examples of free software that students have previously found useful are Zotero, Mendeley or Endnote Web. See <http://www.lib.cam.ac.uk/toolbox/rmt.html> for more details.

References should be formatted in the 'APA' style. In the main text, references are given as '(Vane, 1971)', or 'Vane (1971) showed that...'. These in-text citations count in the word limit. In the bibliography, references are arranged in alphabetical order of surname of the first author, in the form:

Vane, JR. (1971). Inhibition of prostaglandin synthesis as a mechanism of action for aspirin-like drugs. *Nature New Biology*, 231 (25), 232-235.

If there are more than 7 authors, list the first 6 authors followed by an ellipsis (...) then the name of the last author. Reference formatting is described in detail in online here: <https://www.mendeley.com/guides/apa-citation-guide/>. The bibliography is not included in the word limit.

Inadequately acknowledging the work of others is plagiarism. **Both examiners and the general scientific community regard plagiarism as a serious offence.** Where you refer to the work of others (in text or figures), make sure that the original source is fully acknowledged. The electronic version of your dissertation will be assessed in plagiarism-detection software. If you shared a project with another student, you must explicitly acknowledge the relative contributions of each student to all data presented. Further guidance on plagiarism is provided here: <https://www.plagiarism.admin.cam.ac.uk/>, and in the Faculty Board's statement on plagiarism: <https://www.biology.cam.ac.uk/exams/AllExams/plagiarism>

- **Appendices:** It is not necessary to include appendices to the research project report. Appendices are strictly limited to, for example, tables listing materials such as oligonucleotide primers, antibodies, strains, etc. Appendices are not included in the word count, however, they should not be used to include excessive information or as a means of circumventing the word count.
- **Declaration:** In addition to your research project report PDF, you must submit a separate signed declaration on a single page that includes: the project report name, your full name, your College, the word count, the date and a declaration stating: *"I confirm that the material in this research project report, submitted in partial fulfilment of the regulations for NST Part II Pharmacology is not copied from any published material, nor is it a paraphrase or abstract of any published material unless it is identified as such and a full source reference is given. I confirm that, other than where indicated, this document is my own work and has not previously been submitted for a similar purpose."*

Submitting your Research Project Report

Reports should be completed in time for your project supervisor to read and provide feedback before final submission. Your supervisor would probably also appreciate an electronic copy. The deadline for submitting your Research Project Report will be confirmed by the Senior Examiner closer to the time. (It is likely to be 12.30pm on the first Friday of Easter Term.) You must submit your Research Project Report via the Part II Pharmacology Moodle as a single PDF. Your project report will be subject to scrutiny for plagiarism.

Note: In exceptional circumstances, if you think you will be unable to meet the deadline and have good reasons (i.e. illness or other extenuating circumstances) you will need to consult the Senior Examiner and Course Organiser or your College Tutor, who will make a case to the EAMC. Further information can be found at <https://www.educationalpolicy.admin.cam.ac.uk/assessment>.

Project presentations

You will present your Research Project to the Part II examiners. Talks must be presented as PowerPoint presentations. Students who have worked in pairs must present independent talks. Research project presentations will be submitted in advance to undergrad@phar.cam.ac.uk. In previous years, the maximum time limit for presentations has been 10 minutes. The Senior Examiner will confirm the details for this year during Lent Term.

Everyone has their own approach to presenting. However, the following general advice usually works well:

- Keep your slides simple and uncluttered.
- Provide a brief background.
- Dwell on the details of methods only if they are novel or the focus of your work.
- Show your key results and interpret them in the context of the literature.
- Try to finish with a single sentence summary of the take-home message.
- Try to present without using any written notes.
- Reading from a prepared script is strongly discouraged.

You will be assessed on:

- Clear and accurate coverage of key background points, methods and results.
- Thoughtful interpretation and understanding of results.
- Discussion of the strengths and limitations of data.
- Clear and engaging presentation style

Dissertations (BBS only)

Choosing your dissertation title

You will select a dissertation title from lists provided by Pharmacology or your Minor Subject. Pharmacology dissertation titles will be circulated early in the Michaelmas Term. Prospective supervisors will be available to discuss titles before you make the final decision. As most staff supervise 1 or 2 dissertation students, you are not guaranteed to get your first choice of title, but there are more titles on offer than students doing the BBS course.

For students choosing titles from those offered by Pharmacology, please submit your dissertation choices in order of preference via the submission tool on the NST Part II and BBS: Pharmacology Moodle site. Once the allocation has been decided, you are required to submit a form signed by your supervisor agreeing the title of your dissertation to the NST BBS Moodle Site by a published deadline (4pm, 9th November 2023). You require formal permission if you later decide to modify the title of your project, and the appropriate form must be completed before Friday 15th March 2024. Further details can be found here:

<https://www.biology.cam.ac.uk/undergrads/nst/bbs/dissertations>.

Researching your Dissertation

The dissertation provides an opportunity to explore a topic in depth, which requires that you adopt a suitable focus: too broad and you are unlikely to engage effectively with the primary literature; too narrow and you are unlikely to see the bigger picture. Your supervisor will help you with this. Your first meeting with your supervisor should be before the end of Michaelmas Term to get some guidance on initial reading, etc. and to agree on the focus of your dissertation. You can expect to receive a maximum of four supervisions with your dissertation supervisor. You are expected to meet with your supervisor at least twice during the preparation of your dissertation. The final supervision should be after the supervisor has read a draft of your dissertation to allow suggestions for improvements. The supervisor will not read the final version or more than one preliminary version of the dissertation.

You should aim, through reading and discussions with supervisor and others, to provide an extended and balanced review of your field that identifies controversies and gaps in knowledge. Do not be afraid of suggesting your own interpretations.

Preparing your Dissertation

The regulations governing submission of BBS dissertations are laid down by the Faculty: (<https://www.biology.cam.ac.uk/undergrads/nst/bbs/dissertations>).

Note: Dissertations should be completed in time for your project supervisor to read and provide feedback before final submission. Your supervisor is allowed to read and comment on only one draft of the complete dissertation; they will not comment further on the final draft.

Dissertation requirements

- **Maximum length:** 6,000 words, excluding cover sheet, title page, summary, appendices, contents page, tables (and table legends), figures (and figure legends), footnotes, bibliography and acknowledgements. Note that in-text citations (see 'References', below) are counted as part of the 6,000 words.

- **Format:** Your dissertation must be typewritten or word-processed, double spaced, with 2.5 cm margins, a font size for main body text no larger than 12pt and no smaller than 10pt.
- **Cover page:** Your dissertation must be accompanied by an A4 cover page (available at <https://www.biology.cam.ac.uk/undergrads/nst/bbs/dissertations>), and **must** include:
 - the full title (as approved)
 - your full name
 - your supervisor's name
 - your college
 - word count
 - a signed declaration that it is your own original work, and that it does not contain material that has already been used to any substantial extent for a comparable purpose
 - a statement that this is a dissertation submitted in partial fulfilment of the Regulations for NST Part II Biological and Biomedical Sciences.
 - a statement saying "*I have read and understood the Faculty of Biology statement on plagiarism found here: <https://www.biology.cam.ac.uk/exams/AllExams/plagiarism>"*
 - the date
- **Title page:** You should include a title page, with the title of your dissertation, name of your supervisor, the word count and your examination candidate number (BGN). (You should ask your College for your examination number.) Do not include your name on the title page.
- **Summary:** The dissertation must begin with a summary of no more than 300 words.
- **Main text:** Your dissertation should be written in a scientific style, with appropriate sub-sections and with the evidence supported by references that you have read. It is not acceptable to cite references that you have not read. Write concisely. The examiners are looking for clear, concisely written and well-argued dissertations. Do make full use of figures that you develop yourself. Consider carefully whether any abbreviations help. Lists of cryptic abbreviations can be a barrier to understanding for readers from outside your immediate field. Further advice can be found at <https://www.biology.cam.ac.uk/undergrads/nst/bbs/dissertations>
- **References:** A variety of software is available to allow you to manage references. Examples of free software that students have previously found useful are Zotero, Mendeley or Endnote Web. See <https://www.lib.cam.ac.uk/collections/departments/periodicals/find-article-references> for more details.

References should be formatted in the 'Harvard' style, also known as 'Author-date'. In the main text, references are given as '(Vane, 1971)', or 'Vane (1971) showed that...'. These in-text citations count in the word limit. In the bibliography, references are arranged in alphabetical order of surname of the first author, in the form:

Vane JR (1971). Inhibition of prostaglandin synthesis as a mechanism of action for aspirin-like drugs. *Nat New Biol* 231: 232-235.

This is described in detail in the Author Guidelines for the 'Harvard' style can be found at <https://www.mendeley.com/guides/harvard-citation-guide/>. This bibliography is not included in the word limit.

Plagiarism is the inadequately acknowledged citation of the work of others. **Both examiners and the general scientific community regard plagiarism as a serious offence.** Where you refer to the work of others (in text or figures), make sure that the original source is fully acknowledged. The electronic version of your dissertation will be run through plagiarism-detection software. Further guidance on plagiarism is provided on the following link: <https://www.biology.cam.ac.uk/exams/AllExams/plagiarism>.

Submitting your Dissertation

Full instructions will appear on the BBS Moodle site and website

<https://www.biology.cam.ac.uk/undergrads/nst/bbs/dissertations>. Students can submit the electronic version of their dissertation in either PDF or Word format. You must submit your dissertation via the BBS Moodle page [Course: NST Part II Biological and Biomedical Sciences \(23-24\) \(cam.ac.uk\)](#). Your supervisor might also appreciate a copy. Your dissertation will be subject to scrutiny for plagiarism.

The deadline for submission of your dissertation is **12.30 pm on Friday 26th April 2024**.

Note: In exceptional circumstances, if you think you will be unable to meet the deadline and have good reasons (i.e. illness or other extenuating circumstances) you will need to consult the Senior Examiner and Course Organiser or your College Tutor, who will make a case to the EAMC. Further information can be found at <https://www.educationalpolicy.admin.cam.ac.uk/assessment>.

Presenting your dissertation

You will present your dissertation to your Part II BBS colleagues at the end of Lent Term. You will have an opportunity to explain why the dissertation is important and interesting, the most exciting new research you have discovered, and to put forward your own ideas. The format will be based on the popular '3- minute thesis' approach. Each student is allowed no more than 3 minutes to present. You may use a single, PowerPoint slide. Reading from a prepared script is strongly discouraged. Presentation slides will be submitted in advance to undergrad@phar.cam.ac.uk.

Examinations

Written exam papers

There are 4 written exam papers in Pharmacology (May- June). All 4 papers are taken by all candidates from BBS and Part II Pharmacology.

Examinations will be close book in person on Inspera. You will be given a 3-hour window to answer questions in Papers 1, 2 and 3. You will be expected to answer 3 questions from a choice of at least 6. The data interpretation Paper 4 will last 3 hours, with an additional 15 allowed for reading time through the paper. The examiners are not required to provide questions on every lecture course. You are, therefore, strongly advised to avoid being too selective in the choice of topics you revise for examinations.

Note: The format of written exam papers changed in recent years. For reference, specimen examination papers and past papers are available via Moodle, but the format may have been different.

Credit will be given for answers that go beyond straightforward recall of lectures and which successfully integrate materials from the literature and from different lecture series. The marking criteria used by examiners (see below) illustrate the importance attached to this aspect.

For Part II Pharmacology, the four examination papers in Pharmacology (papers 1-4) contribute 70 % of the marks, the Drug Review (including presentation) contributes 10 % of the marks and the research project (including presentation) contributes 20 % of the marks.

For BBS students, the four examination papers in Pharmacology (papers 1-4) contribute 64 % of the marks, the minor subject contributes 16 % of the marks and the dissertation contributes 20 % of the marks. Note that BBS students do not submit a Drug Review.

Oral examination

The examiners may invite candidates from either course for an additional oral examination (viva). The Senior Examiner will inform you in the Easter Term of the dates for oral examinations, but you will get very short notice (by e-mail) of whether you are required to attend an oral examination. You should keep the dates free, until advised that you are not required to attend an oral exam. You must ensure that you will be available should the examiners request your attendance at a viva.

Any questions about the written exams or vivas should be addressed to the Senior Examiner, Prof Mark Howarth (mh2186@cam.ac.uk) not the Course Organiser.

Examiners Essays Guidelines

It is normal practice for answers to the essay questions in Part II examinations to be read by two people, who are likely to differ in the extent of their expertise in the field covered by the question. A good answer will aim to address the needs of both types of reader. Thus, as well as addressing (often necessarily selectively) details of recent relevant research, it will also set the subject matter in its broader context, giving appropriate consideration to the significance and historical development of the subject matter.

Class	Description
First	<p>Work which is excellent both in the range and command of the material covered and in the argument and analysis. Work that is excellent in its understanding of the subject; that has engaged closely with the question; that has shown some originality and treated the evidence critically; that brings in relevant material from an appropriate range of sources; and that is well-planned and complete.</p> <p>A first class mark may be awarded on more than one set of criteria: there may be a great deal of relevant information, displaying substantial knowledge and understanding; the arguments and presentation may be stylish; the approach may be original, critical or unorthodox. An upper first would be an outstanding performance, meeting all, or virtually all, of these criteria. A low first would meet at least some of these criteria.</p>
Upper Second	<p>Work that shows a good broad-based knowledge of the topic and the lecture material; that is presented in an organised way; and clearly argued and focused on the set question. Answers at the top end of this class would often include material from outside the taught material and where relevant, from different lecture courses and would include some attempt to treat the evidence critically and to synthesise arguments. Answers at the lower end of this class would be competent, accurate in reproducing lecture material and show evidence of reading of the principal sources of published work on the subject.</p>
Lower Second	<p>Work that overall shows a reasonable competence in the understanding and presentation of the relevant material. Answers at the top end of this class would show competent understanding of the basic lecture material or reasonable organisation and focus; an answer at the lower end would show gaps in understanding and coverage together with poor organisation and focus. Certain types of uneven work would fall into this class; detailed factually-correct work that did not relate a broad knowledge of the topic to the specific question asked, or work with clear organisation and some insight but with serious omissions of factual knowledge.</p>
Third	<p>At the upper end of the class, work that just shows competent knowledge of the basic, core material. At the lower end of the class, work that shows some knowledge of the material but with serious deficiencies in understanding, coverage and organisation. This will include work that is unduly brief or largely misses the point of the question.</p>
Fail	<p>Work that is irrelevant, shows a considerable degree of ignorance or is short and superficial. Where the question is barely attempted.</p>

Plagiarism

Lecturers and examiners take plagiarism extremely seriously. Future employers are likely also to regard plagiarism as evidence of untrustworthiness.

The following guidance has been issued by the Faculty Board of Biology:

<https://www.biology.cam.ac.uk/exams/AllExams/plagiarism>

As agreed by the General Board: "Plagiarism is defined as submitting as one's own work, irrespective of intent to deceive, that which derives in part or in its entirety from the work of others without due acknowledgement; or, in the case of self-plagiarism, unless explicitly permitted by regulation, submitting one's own work that has already been submitted for assessment to satisfy the requirements of any other academic qualification, or submitted for publication without due acknowledgement. It is both poor scholarship and a breach of academic integrity."

Such use of unfair means will not be tolerated by the University; if detected, the penalty may be severe and may lead to disciplinary proceedings being taken against you.

The scope of plagiarism

Plagiarism is defined as submitting as one's own work, irrespective of intent to deceive, that which derives in part or in its entirety from the work of others without due acknowledgement.

Examples of plagiarism include copying (using another person's language and/or ideas as if they are a candidate's own), by:

- quoting verbatim another person's work without due acknowledgement of the source
- paraphrasing another person's work by changing some of the words, or the order of the words, without due acknowledgement of the source
- using ideas taken from someone else without reference to the originator
- cutting and pasting from the Internet
- submitting someone else's work as part of a candidate's own without identifying clearly who did the work. For example, buying or commissioning work via professional agencies such as 'essay banks' or 'paper mills', or not attributing research contributed by others to a joint project

Plagiarism might also arise from colluding with another person, including another candidate, other than as permitted for joint project work (i.e. where collaboration is concealed or has been forbidden). A candidate should include a general acknowledgement where he or she has received substantial help, for example with the language and style of a piece of written work.

Plagiarism can occur in respect to all types of sources and media:

- text, illustrations, musical quotations, mathematical derivations, computer code, etc
- material downloaded from websites or drawn from manuscripts or other media
- published and unpublished material, including lecture handouts and other students' work

Acceptable means of acknowledging the work of others (by referencing, in footnotes, or otherwise) vary according to the subject matter and mode of assessment. Faculties or Departments should issue written guidance on the relevant scholarly conventions for submitted

work, and also make it clear to candidates what level of acknowledgement might be expected in written examinations. Candidates are required to familiarise themselves with this guidance, to follow it in all work submitted for assessment, and may be required to sign a declaration to that effect. If a candidate has any outstanding queries, clarification should be sought from her or his Director of Studies, Course Director or Supervisor as appropriate.

Self-plagiarism is defined as submitting one's own work, that has already been submitted for assessment, to satisfy the requirements of any other academic qualification or submitted for publication without due acknowledgement.

Examples of self-plagiarism include:

- writing an essay twice or more for a single set of exams
- writing the same essay, or a substantial part of an essay, twice in the same exam
- memorising substantial blocks of text and reproducing them more than once as the whole or as parts of an answer in an exam

Failure to conform to the expected standards of scholarship (e.g. by not referencing sources) in examinations may affect the mark given to the candidate's work. In addition, suspected cases of the use of unfair means (of which plagiarism is one form) will be investigated and may be brought to one of the University's Courts. The Courts have wide powers to discipline those found guilty of using unfair means in an examination, including depriving such persons of membership of the University, and deprivation of a degree.

How to avoid plagiarism

The stylistic conventions for different subjects vary and you should consult your Course Organiser or project supervisor about the conventions pertaining in your particular subject area. Most courses will issue written guidance on the relevant scholarly conventions and you are expected to have read and to follow this advice. However, the main points that apply to submitted work (e.g. dissertations, project reports) are:

- when presenting the views and work of others, include in the text an indication of the source of the material, e.g. 'as Sharpe (1993) has shown,' and give the full details of the work quoted in your bibliography
- if you quote text verbatim, place the sentence in inverted commas and give the appropriate reference, e.g. 'The elk is of necessity less graceful than the gazelle' (Thompson, 1942, p 46) and give the full details in your bibliography as above
- if you wish to set out the work of another at length so that you can produce a counterargument, set the quoted text apart from your own text (eg by indenting a paragraph) and identify it by using inverted commas and adding a reference as above. NB long quotations may infringe copyright, which exists for the life of the author plus 70 years
- if you are copying text, keep a note of the author and the reference as you go along, with the copied text, so that you will not mistakenly think the material to be your own work when you come back to it in a few weeks' time
- if you reproduce an illustration or include someone else's data in a graph include the reference to the original work in the legend, eg (figure redrawn from Webb, 1976) or (triangles = data from Webb, 1976)
- if you wish to collaborate with another person on your project, you should check with the Course Organiser to see whether this might be allowed and then seek their permission; if

you have been authorised to work together with another candidate or other researchers, you must acknowledge their contribution fully in your introductory section. If there is likely to be any doubt as to who contributed which parts of the work, you should make this clear in the text wherever necessary, e.g. 'I am grateful to A. Smith for analysing the sodium content of these samples'

- be especially careful if cutting and pasting work from electronic media; do not fail to attribute the work to its source. If authorship of the electronic source is not given, ask yourself whether it is worth copying
- don't memorise substantial blocks of text in lieu of essay answers; tailor your answer to the question being asked. Please note that during written answers for unseen examination papers, you will not be penalised for failures to reference information in this manner.

The Golden Rule

The examiners must be in no doubt as to which parts of your work are your own original work and which are the rightful property of someone else. For the University-wide statement on plagiarism, and further information on the topic, please click here (<https://www.plagiarism.admin.cam.ac.uk/>)

Exam review Procedure

The University has robust policies in place to ensure that examination results are accurate. However, there may be circumstances where something unusual happens during the examination and you want it taken into account. The University has procedures in place to deal with this possibility. Please see: <http://www.studentcomplaints.admin.cam.ac.uk/examination-reviews> for further details. This includes what to do if something goes wrong during the examination process, or if your personal circumstances affected your exam.

Students are strongly urged to seek advice from their College Tutor (or relevant Departmental staff). Students can also receive free independent advice regarding any University procedure from the Students' Unions' Advice Service at www.studentadvice.cam.ac.uk.

Working in the Department

Who's Who: Staff and their responsibilities

You can find out more about staff, their research interests and contact details from our web site (www.phar.cam.ac.uk). Some staff also have specific responsibilities related to the Part II course:

Dr Catherine Wilson (chw39@cam.ac.uk)	Course Organiser	All matters relating to Part II course (except those listed below)
Dr Andrzej Harris (ams243@cam.ac.uk)	Deputy Course Organiser	All matters relating to projects and dissertations
Prof Mark Howarth (mh2186@cam.ac.uk)	Senior Examiner, Part II	All matters relating to Part II exams
Christine Roberts (undergrad@phar.cam.ac.uk)	Undergraduate Student Administrator	All matters relating to undergraduate students
Nadine Law (safety@phar.cam.ac.uk)	Principal Technician & Safety Officer	Health & safety. Communal equipment
Thury Agustsdottir (DA@phar.cam.ac.uk)	Departmental Administrator	Welfare. Dignity at work.
Mr Matt Skipper (ithelpdesk@phar.cam.ac.uk)	Computer Officer	Computing

Access and Security

Your university card provides 24-hour access to the Department (via front or back doors). If you are in the Department outside normal working hours (Monday-Friday, 8am-6pm), you must sign in via the online portal when you arrive and depart (<https://outofhours.phar.cam.ac.uk/> link at the bottom of the Department webpage under Out of Hours Sign In). This is to provide emergency services and security staff with the information they need in case of an emergency. **You must not work unsupervised in labs outside working hours.**

Everyone is responsible for Departmental security. Do not allow others into the Department outside working hours and please make sure that the door locks behind you when you arrive and leave. The latter is particularly important when it is windy (check the back door has not blown open as you leave). It is advisable to lock doors to labs/offices if you will be out of the room for more than a few minutes. Contact security (01223 331818) immediately if you suspect unauthorised staff may have entered the building.

Computing

The Department has a domain called PHAR.

IT support is available from Monday to Friday 8 am to 4 pm. If you have any IT-related issues, please contact IT staff for assistance. If you report a problem, please state the number of the machine. If you have any problem with the machines or printers, send an email to:

ithelpdesk@phar.cam.ac.uk.

Login to PHAR domain

Enter your username, which should be in the form of your University CRSiD (e.g., aa123). You will be issued a temporary password at the start of term, which you are required to change. To change your password at first login, you will be prompted to enter a new one, retype it and click OK (password must be more than 8 characters, mixed alpha-numeric, capital and lowercase). Even if you are not planning to use the IT resources of the Department, you MUST change your password, otherwise your account could be used by someone else.

Data storage

The University UIS offers three third-party cloud-based data storage services that you can associate with your @cam email address: OneDrive, GoogleDrive, and DropBox. Only you can access your storage account with your Raven/UIS login, but you can share your data with others whilst keeping the remaining data private.

Please note that we do not recommend or endorse any one of these cloud storage drives. You need to read the information provided by UIS and make your own decision:

<https://help.uis.cam.ac.uk/individual-storage>

Printing

We use DS-Print and printers are automatically installed for your user accounts. Please print to Phar_FindMe. Printing Credit can be purchased in multiples of £1 from <https://www.ds.cam.ac.uk/mydsprint/>. Also, you can install the Phar_FindMe printers on your laptop by following instructions here - <https://help.uis.cam.ac.uk/service/printing>.

Email

You should only use the preferred university webmail (XXX@cam.ac.uk). You will be contacted by academics and administrators directly by email, Quickmail or an announcement via the Moodle site.

Electronic journals

All computers in the library are connected to the University Library Electronic Journals database from www.lib.cam.ac.uk, which includes ScienceDirect titles. There is no need to get a new user id and password for Athens accounts use your Raven credentials.

Card access

Problems with card access should be reported immediately to reception@phar.cam.ac.uk, especially if you lose your card. You must contact your College directly for any card renewal.

Moodle

All Pharmacology resources/courses are published here: <https://www.vle.cam.ac.uk/login/index.php>. Moodle uses Raven to verify users. All University members should have a Raven account; if not visit this page: <https://help.uis.cam.ac.uk/service/accounts-passwords>.

Rules governing use of computing facilities

The following rules, designed to ensure effective operation of the Department's computing facilities, apply to all users. Breaches of the rules are taken seriously and can lead ultimately to offenders being denied use of University computing facilities.

- No equipment may be connected into any network or other facility of the Department without prior written agreement from the Computer Officer. This includes setting up or connecting to wireless networks, VPNs or proxies in the Department.
 - Users must not watch on-demand TV, listen to Internet radio, or use YouTube, iPlayer, etc or similar applications and sites for non-course content material.
 - Downloading and installing unlicensed or freeware software is forbidden unless authorized by the Computer Officer. Using applications to download and share copyrighted materials or play computer games are not permitted.
 - Users must adhere to the terms and conditions of all licence agreements, including software, equipment, services, documentation and other goods. Users must not load any software onto the computer facilities without permission from the Computer Officer.
 - Users must not deliberately introduce any virus, worm, Trojan horse or other harmful or nuisance programs or files into any computing facility. Users must not take deliberate action to circumvent precautions taken or prescribed by the Department to prevent installation of such nuisance programs.
 - Users must not read, copy, delete or amend the data or data structures of other users without their permission.
 - Users must not use another user's ID or password, nor communicate any password to another person. Users must take reasonable precautions to avoid discovery of their password by others. Do not leave computing facilities unattended when you are logged in and so potentially useable by others.
 - The creation, display, production or circulation of illegal or offensive material is forbidden.
 - Smoking, eating or drinking in computing facilities is forbidden.
 - Users must conduct themselves in a quiet and orderly manner when using computing facilities.
 - Users' data and software are subject to published procedures for their removal or archiving after specified periods.
 - Users' printouts and other outputs will be disposed of after published periods if not collected.
 - Please co-operate with the Computer Officer in keeping the computing facilities tidy. Remove outputs and papers from computing facilities and dispose of unwanted items.
- Details of the rules on the computing facilities can be found here:

<http://www.cam.ac.uk/cs/itsyndicate/>

Health and safety

Your safety and that of your colleagues may depend upon you knowing how to deal with emergencies. There is also a legal responsibility, imposed upon you and staff of the Department, to ensure that all activities comply with Health and Safety legislation. If you have any concerns about safety matters, please bring them to the immediate attention of your supervisor or the Department's safety officer, Nadine Law (Safety@phar.cam.ac.uk , ext. 34031).

Before beginning any laboratory work, **you are required to attend a safety course**. The course is mandatory: you will not be allowed to begin your project unless you attend.

When working in laboratories, you must never work unsupervised, and you must be familiar with the risk assessment describing any procedures you use. Before you start work, familiarise yourself with the locations of fire extinguishers, fire blankets, fire alarms, circuit breakers, and any additional safety items described in your risk assessments.

Some of you will complete projects in other Departments. You should make sure that your supervisor provides all the local safety information relating to that Department.

In the event of an accident, however minor, call for help immediately.

- Spills should be contained if possible.
- Electricity should be isolated where possible, but without endangering yourself.
- Fires should be tackled only if the risk is low. In all cases, sound the alarm immediately. Close doors and windows if possible.
- A list of emergency numbers is displayed by each phone. Call for help if needed.

It is a legal requirement to report all accidents and near misses in the workplace, however minor. You must advise your supervisor or the Safety Officer immediately of any accident.

Risk assessments must be completed for all laboratory work. You must see copies of these risk assessments before starting any procedure. You should sign the assessment to show that you have read it. If you are not shown risk assessments, ask for them. If any aspect of a risk assessment is unclear, ask for clarification before you start work. Risk assessments identify the main hazards of a task, how these hazards are controlled, any residual risk and what to do if an accident occurs. You must comply with all control measures in a risk assessment (e.g. the use of personal protective equipment, shielding, fume extraction etc.).

Hazards are common to all labs and cannot be considered 'clean' areas. Requirements:

- Wear a lab coat and safety glasses: your lab will provide these.
- Tie back long hair
- Do not wear open sandals
- Refrain from eating, drinking or applying cosmetics
- Never store food or discard food wrappings within a lab (or lab facilities such as cold rooms)

The **fire alarm** is a continuous buzzer. If the fire alarm it sounds, leave the lab and follow instructions to assemble in front of the Judge Institute. There is a test on Wednesdays at 8.30am; you do not need to respond to this unless it continues for more than about 30 seconds.

Emergency numbers are displayed by each phone. It is worth putting some of these and the University Security Section number (01223 331818) in your mobile phone for quick reference.

There are many **specific hazards** in the Department, including animal allergens, centrifuges, hazardous chemicals, lasers and UV light sources. If your work exposes you to any of these hazards, you must be familiar with the risk assessment. Do not expose yourself to any of these hazards without training and familiarity with the risk assessment. To avoid the possibility of

becoming trapped in a cold room, use them only during normal working hours and leave the door slightly ajar for short visits.

The **Personal Protective Equipment (PPE)** required will be described in the risk assessment. It should be provided by the lab in which you are working, but it can also be obtained from the Teaching Lab or the Departmental Safety Officer.

- **Lab coats and safety glasses must be worn at all times in laboratories.** Lab coats should be removed when leaving the lab unless they are needed to provide protection when moving materials between research areas. They must never be worn in the toilets or Café. Lab coats must be laundered regularly: your host lab will advise on arrangements. In some cases (e.g. when handling liquid nitrogen or pathogens), additional protection may be required: this will be described in the risk assessment.
- **Gloves** may be worn as required and must be used when required by the risk assessment. One hand must be un-gloved when moving around the Department to prevent contamination. In the unlikely event of an allergic reaction to gloves, please consult the Safety Officer. There are specific gloves for handling hot or cold materials.
- In addition to the safety glasses used for routine lab work, **full-face shields** must be worn for UV light sources (UV-blocking), liquid nitrogen and other operations where the danger is to the whole face. Good handling techniques, such as opening vials away from you, and shielding should also be used to minimise risk of eye injuries.

Waste disposal guidelines are found on posters in every lab. Many of these rules are imposed by legislation. Seek advice from your supervisor if you are unsure of the correct route for waste disposal. Additional rules (and recording procedures) apply for radioactive and bioactive waste.

This guide is not comprehensive. Your host laboratory should provide all the additional information and training you need to work safely in the laboratory. Do not be afraid to ask for advice and/or clarification. The Intranet section of our web pages provides additional information. The Safety Officer, Nadine Law (Safety@phar.cam.ac.uk), is available to answer any queries relating to safety. She will give a presentation on laboratory safety in the preparing for projects session (see timetable). **Attendance is compulsory** for all students undertaking a laboratory-based research project.

Pharmacology as a Career

Postgraduate studies

You may be considering postgraduate research (for a PhD or Masters) alone or in combination with clinical training. It is a good idea to make informal enquiries with potential supervisors (here or elsewhere) as soon as possible: some departments will have their applications procedures well underway by Christmas. Anyone interested in studying for a PhD in this Department should examine the list of research interests on the Department web site, and contact Dr Rahman (mtur2@cam.ac.uk), who organises all graduate admissions, as soon as possible. The sooner you make contact, the wider the range of possible sources of funding that are available. Details of PhD opportunities elsewhere are posted on a notice board on Level 1.

The Department is very happy to support applications to the British Pharmacological Society for their prestigious A. J. Clark studentship (<https://www.bps.ac.uk/membership-awards/prizes,-awards-and-grants/our-prizes/aj-clark-studentship>). The deadline to apply for the 2024 award is 31 October 2023 and the application fairly long, so you should contact a potential supervisor immediately if you are interested.

Members of the Department offer rotation projects as part of several 4-year PhD programmes or Doctoral Training Programmes (DTPs), including those funded by the BBSRC (<https://bbsrcdtp.lifesci.cam.ac.uk/>), MRC (<https://mrcdtp.medschl.cam.ac.uk/>) and British Heart Foundation (<https://www.cardiovascular.cam.ac.uk/students/prospective/phd-bhfcadio>), amongst others.

British Pharmacological Society

The British Pharmacological Society (BPS) is the society to which almost every British pharmacologist subscribes. Associate Undergraduate Student Membership is available to undergraduates working on a pharmacological topic and to medical students until the completion of their degree. You are all entitled to FREE membership of BPS during your Part II course in Pharmacology. But you need to sign-up. It is straightforward to apply from the BPS web site: <https://www.bps.ac.uk> The benefits include:

- free or discounted rates at BPS scientific meeting
- free access to the full online versions of the British Journal of Pharmacology and British Journal of Clinical Pharmacology
- bursaries and travel grants to attend meetings in the UK and overseas
- network with scientists across a range of age and experience at the Connected Community website
- free print versions of Pharmacology Matters, the BPS magazine
- opportunities to contribute to advancing pharmacology, across a range of activities, through the Society's committees, special interest groups and working parties
- join the Clinical Section, bridging the gap between the medical profession, clinical research and the pharmaceutical industry

Timetable 2023- 2024

Unless stated all events are held in the Seminar Room, Pharmacology.

Date of Lecture	Time	Topic	Lecturer
Michaelmas Term	2023		
6th Oct 2023	10am	Welcome to Part II <i>Followed by tea and cakes in café (level 4) at 11 am</i>	Dr C Wilson
9th Oct 2023	9am	Thrombosis	Dr Harper
10th Oct 2023	9am <i>2pm</i>	Thrombosis <i>Study Skills</i>	Dr Harper <i>Dr Andrzej Harris</i>
11th Oct 2023	9am	Thrombosis	Dr Harper
12th Oct 2023	9am	Thrombosis	Dr Harper
13th Oct 2023	9am 10am <i>11am 12.30pm</i>	Thrombosis Tech Talk: Protein analysis technology <i>Study Skills</i> <i>Pharmacology</i> <i>Seminar Series: AI antibody development</i>	Dr Harper Dr Keeble <i>Dr Andrzej Harris</i> <i>Dr Pietro Sormanni</i>
16th Oct 2023	9am 10am <i>3:30pm</i>	Drug Discovery Drug Discovery <i>Introduction to Drug Review</i>	Dr Hall Dr Hall <i>Dr Andrzej Harris</i>
17th Oct 2023	9am 10am <i>1-3pm</i>	Epithelial Transporters Epithelial Transporters <i>Library Research Skills</i>	Dr MacVinish Dr MacVinish <i>Dr Phillips or Eleanor Barker</i>
18th Oct 2023	9am	Tech Talk: Understanding Sensory Systems /	Drs Higham / Pattison

	10am	Chemogenetics & Viruses Epithelial Transporters	Dr MacVinish
19th Oct 2023	9am 10am	GPCR Pharmacology Tech Talk: Fluorescence and Bioluminescence	Prof Ladds Drs Ascanelli / Pearce
20th Oct 2023	9am 10am <i>11am 12.30pm</i>	GPCR Pharmacology Drug Discovery <i>Essay Writing Pharmacology Seminar Series: Aging related disorders</i>	Prof Ladds Dr Hall <i>Dr Andrzej Harris Dr Delphine Larrieu</i>
23rd Oct 2023	9am 10am	GPCR Pharmacology Gut Hormones	Prof Ladds Prof Gribble
24th Oct 2023	9am 10am <i>12noon</i>	GPCR Pharmacology Gut Hormones <i>Essay Writing</i>	Prof Ladds Prof Gribble <i>Dr Andrzej Harris</i>
25th Oct 2023	9am 10am	Brain control of food intake Gut Hormones	Prof Yeo Prof Gribble
26th Oct 2023	9am 10am <i>11am - 2pm</i>	Brain control of food intake Gut Hormones <i>Careers pop-up drop in</i>	Prof Yeo Prof Gribble <i>Careers Service (Lucy Romijn) Held in Break out area, Ground Floor</i>
27th Oct 2023	9am 10am <i>12.30pm</i>	Cys-loop Receptors PI3Kinase <i>Pharmacology Seminar Series:VP Translational Science</i>	Prof Lummis Dr Hawkins <i>Dr Alastair Brown</i>
30th Oct 2023	9am 10am	Cys-loop Receptors PI3Kinase	Prof Lummis Dr Hawkins
31st Oct 2023	9am	Cys-loop Receptors	Prof Lummis

	10am <i>12noon</i>	PI3Kinase <i>Preparing for Dissertations</i>	Dr Hawkins <i>Dr Andrzej Harris</i>
1st Nov 2023	9am 10am	Ubiquitination & the Cell Cycle Protein Misfolding	Dr Lindon Prof Itzhaki
2nd Nov 2023	9am 10am	Ubiquitination & the Cell Cycle Protein Misfolding	Dr Lindon Prof Itzhaki
3rd Nov 2023	9am 10am <i>12.30pm</i>	Ubiquitination & the Cell Cycle Protein Misfolding <i>Pharmacology Seminar Series: Pain/Itch</i>	Dr Lindon Prof Itzhaki <i>Prof Hanns Ulrich Zeilhofer</i>
6th Nov 2023	9am 10am	Ubiquitination & the Cell Cycle Protein Misfolding	Dr Lindon Prof Itzhaki
7th Nov 2023	9am 10am	Tech Talk: Molecular Biology Expert Industry Talk: Novel therapeutic modalities	Dr Prole Dr Rees (AZ)
8th Nov 2023	9am 10am	Cancer Therapies Cancer Therapies	Dr Twigger Dr Wilson
9th Nov 2023	9am 10am 2:30pm	Cancer Therapies Cancer Therapies Expert Industry Talk: Monoclonal antibodies & Covid	Dr Twigger Dr Anne Corcoran Drs Ambry & Rajan
10th Nov 2023	9am 10am <i>12.30pm</i>	Cancer Therapies Cancer Therapies <i>Pharmacology Seminar Series: Protien misfolding, inflammation, ALS</i>	Prof Khaled Dr Anne Corcoran <i>Dr Cintia Roodveldt</i>

13th Nov 2023	9am 10am	Cancer Therapies Cancer Therapies	Prof Khaled Dr Wilson
14th Nov 2023	9am 10am	Tech Talk: Flow cytometry/ RNAseq Cancer Therapies	Drs Pensa and Twigger Dr Wilson
15th Nov 2023	9am 10am	Circadian Rhythms Expert Industry Talk: Careers with AZ	Dr Munns Dr Moore
16th Nov 2023	9am 10am	Circadian Rhythms Expert Talk: Being an Academic Clinical Fellow	Dr Munns Dr Ping Ong
17th Nov 2023	9am 10am <i>12.30pm</i> <i>2pm</i>	Circadian Rhythms Voltage Gated Channels <i>Pharmacology</i> <i>Seminar Series: Ion channels</i> <i>Data interpretation</i>	Dr O'Neill Dr Prole <i>Prof Henry Colecraft</i> <i>Dr Wilson</i>
20th Nov 2023	9am 10am	Circadian Rhythms Voltage Gated Channels	Dr O'Neill Dr Rahman
21st Nov 2023	9am 10am <i>2pm</i>	GABA receptors Voltage Gated Channels <i>Data interpretation</i>	Dr Miller Dr Prole <i>Dr Wilson</i>
22nd Nov 2023	9am 10am	GABA receptors Voltage Gated Channels	Dr Miller Dr Rahman
23rd Nov 2023	9am 10am	GABA receptors Voltage Gated Channels	Dr Miller Dr Rahman
24th Nov 2023	9am 10am 11am <i>12.30pm</i>	GABA receptors Voltage Gated Channels Feedback meeting	Dr Miller Dr Rahman <i>Dr Stephanie Nestorow and Dr Anthony Keeble</i>

		<i>Pharmacology Seminar Series: PDRA talks</i>	
27th Nov 2023		<i>Intro to R drop in session</i>	<i>Craik-Marshall (Downing Site)</i>
28th Nov 2023	<i>9.30am-5.30pm</i>	<i>Stats practical workshop</i>	<i>Craik-Marshall (Downing Site)</i>
29th Nov 2023	<i>9.30-5.30pm</i>	<i>Stats practical workshop</i>	<i>Craik-Marshall (Downing Site)</i>

Date of Lecture	Time	Topic	Lecturer
Lent Term	2024		
19th Jan 2024	10am - Midday <i>3.30pm</i>	Preparing for projects <i>Pharmacology Seminar Series</i>	Dr Wilson
22nd Jan 2024	9am 10am	Multidrug Transporters Metabolic disease	Prof van Veen Prof Henderson
23rd Jan 2024	9am 10am	Multidrug Transporters Metabolic disease	Prof van Veen Prof Henderson
24th Jan 2024	9am 10am	Multidrug Transporters Metabolic disease	Prof van Veen Prof Henderson
25th Jan 2024	9am	Multidrug Transporters	Prof van Veen
26th Jan 2024	9am 10am <i>3.30pm</i>	Multidrug Transporters Metabolic disease <i>Pharmacology Seminar Series</i>	Prof van Veen Prof Henderson
29th Jan 2024	9am	Pain	Prof Smith

30th Jan 2024	9am <i>10 - 1pm</i>	Pain <i>Drug Review</i> <i>Presentations</i>	Prof Smith <i>Meeting room 5</i>
31st Jan 2024	9am <i>10 - 3pm</i>	Pain <i>Drug Review</i> <i>Presentations</i>	Prof Smith <i>Meeting room 5</i>
1st Feb 2024	9am <i>11 - 3pm</i>	Infectious disease <i>Drug Review</i> <i>Presentations</i>	Prof Howarth <i>Meeting room 5</i>
2nd Feb 2024	9am <i>10 – 3.30pm</i> <i>3.30pm</i>	Pain <i>Drug Review</i> <i>Presentations</i> <i>Pharmacology Seminar</i> <i>Series</i>	Prof Smith <i>Meeting room 5</i>
5th Feb 2024	9am	Infectious disease	Prof Howarth
6th Feb 2024	9am	Infectious disease	Prof Howarth
7th Feb 2024	9am	Novel antimicrobials	Dr Mela
8th Feb 2024	9am	Novel antimicrobials	Dr Mela
9th Feb 2024	9am <i>3.30pm</i>	Novel antimicrobials <i>Pharmacology Seminar</i> <i>Series</i>	Dr Mela
12th Feb 2024	9am	cAMP	Prof Cooper
13th Feb 2024	9am	cAMP	Prof Cooper
14th Feb 2024	9am	cAMP	Prof Cooper
15th Feb 2024	9am 10am	cAMP Proteostasis Therapeutics for Protein Conformational Diseases	Prof Cooper Prof Morimoto
16th Feb 2024	9am <i>3.30pm</i>	Hypertension <i>Pharmacology Seminar</i> <i>Series</i>	Prof Wilkinson

19th Feb 2024	9am	Hypertension	Prof Wilkinson
20th Feb 2024	9am <i>2pm</i>	Hypertension <i>Data interpretation</i>	Prof Wilkinson <i>Dr Miller</i>
21st Feb 2024	9am	Hypertension	Prof Wilkinson
22nd Feb 2024	9am	Cardiac ion channels	Prof Roderick
23rd Feb 2024	9am <i>3.30pm</i>	Cardiac ion channels <i>Pharmacology Seminar Series</i>	Prof Roderick
26th Feb 2024	9am	Cardiac ion channels	Prof Roderick
27th Feb 2024	9am	Cardiac ion channels	Prof Roderick
28th Feb 2024	9am	Stem cells	Prof Khaled
29th Feb 2024	9am	Stem cells	Prof Khaled
1st Mar 2024	9am <i>2pm</i> <i>3.30pm</i>	Stem cells <i>Data Interpretation</i> <i>Pharmacology Seminar Series</i>	Prof Khaled <i>Dr Miller</i>
4th Mar 2024	9am 10am	Ageing Feedback meeting	Dr Larrieu
5th Mar 2024	9am	Ageing	Dr Larrieu
6th Mar 2024	9am	Ageing	Dr Larrieu
7th Mar 2024	<i>9-12pm</i>	<i>BBS presentations</i>	<i>Seminar room</i>
8th Mar 2024	<i>9-12pm</i> <i>2 – 3.30pm</i> <i>3.30pm</i>	<i>BBS presentations</i> <i>BBS presentations</i> <i>Pharmacology Seminar Series</i>	<i>Seminar room</i> <i>Seminar room</i>
11th Mar 2024	<i>3.30pm</i>	<i>Revision</i>	<i>Dr Andrzej Harris</i>
12th Mar 2024	<i>10am</i>	<i>Revision</i>	<i>Dr Andrzej Harris</i>

13th Mar 2024			

Date of Lecture	Time	Topic	Lecturer
Easter Term	2024		
29 th April 2024	<i>9-12pm</i>	<i>Project presentations</i>	<i>Meeting room 5</i>
1st May 2024	<i>9-4pm</i>	<i>Project presentations</i>	<i>Meeting room 5</i>
2nd May 2024	<i>9-2.30pm</i>	<i>Project presentations</i>	<i>Meeting room 5</i>
3rd May 2024	<i>9-2.30pm</i>	<i>Project presentations</i>	<i>Meeting room 5</i>