



UNSW Course Outline

PHAR3102 Molecular Pharmacology - 2024

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General Course Information

Course Code : PHAR3102

Year : 2024

Term : Term 1

Teaching Period : T1

Is a multi-term course? : No

Faculty : Faculty of Medicine and Health

Academic Unit : School of Biomedical Sciences

Delivery Mode : In Person

Delivery Format : Standard

Delivery Location : Kensington

Campus : Sydney

Study Level : Undergraduate

Units of Credit : 6

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

You will learn the molecular basis of drug action and explore how cutting-edge biotechnology and biomedical research advances pharmacological knowledge. Detailed coverage includes: genetic variability in drug action, protein structure-activity relationships, receptor-ligand

interactions, signal transduction, biochemical and molecular aspects of drug targets and their signalling mechanisms. The course has a strong focus on developing research and analytical skills.

Course Aims

Building on basic pharmacology skills learned in PHAR2011, the objectives of this course are to

1. explore the basis for drug actions at the molecular level from binding to a target to eliciting a cellular outcome
2. develop an understanding of why certain molecules might be classified as agonists, antagonists or inverse agonists and the circumstances under which this classification might change
3. build an appreciation of how cellular context and genetic variability can impact the effect of a drug at the molecular level
4. acquire skills in the interpretation and analysis of molecular pharmacology experiments and the ability to decide whether the data supports the conclusions presented

Relationship to Other Courses

Assistance with progression checking:

If you are unsure how this course fits within your program, you can seek guidance on optimising your program structure from staff at the [Nucleus Student Hub](#).

- Progression plans for UNSW Medicine and Health programs can be found on the [UNSW Medicine & Health website](#).
- Progression plans for UNSW Science programs can be found on the [UNSW Science website](#).

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Apply knowledge of molecular pharmacology of drug targets to pharmacological problems
CLO2 : Describe the effect of genetic variability on drug action
CLO3 : Apply knowledge of molecular biology techniques to the design of experiments to test molecular pharmacology hypotheses
CLO4 : Record, analyse and/or draw conclusions from experimental data

Course Learning Outcomes	Assessment Item
CLO1 : Apply knowledge of molecular pharmacology of drug targets to pharmacological problems	<ul style="list-style-type: none"> • Progress Quizzes • Journal Club • Laboratory Notebook • End of session examination
CLO2 : Describe the effect of genetic variability on drug action	<ul style="list-style-type: none"> • Progress Quizzes • Journal Club • End of session examination
CLO3 : Apply knowledge of molecular biology techniques to the design of experiments to test molecular pharmacology hypotheses	<ul style="list-style-type: none"> • Laboratory Notebook • Progress Quizzes • Journal Club • End of session examination
CLO4 : Record, analyse and/or draw conclusions from experimental data	<ul style="list-style-type: none"> • Laboratory Notebook • Progress Quizzes • Journal Club • End of session examination

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

All course materials and course announcements are provided on the course learning management system, Moodle.

By accessing and using the ICT resources provided by UNSW, you are agreeing to abide by the ['Acceptable Use of UNSW ICT Resources'](#) policy particularly on respect for intellectual property and copyright, legal and ethical use of ICT resources and security and privacy.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Progress Quizzes Assessment Format: Individual	25%	Due Date: Quizzes will be held in tutorial class in weeks 3, 5, 8 and 10
Journal Club Assessment Format: Individual	20%	Due Date: Final submission: Friday 12th April 5pm
Laboratory Notebook Assessment Format: Individual	15%	Due Date: Submissions due (1) Monday 26th Feb 5pm, (2) Monday 4th March 5 pm, (3) Friday 19th April 9am
End of session examination Assessment Format: Individual	40%	Due Date: During Final Exam period

Assessment Details

Progress Quizzes

Assessment Overview

The quizzes will give you feedback on how you are progressing in the course. They will test not only your knowledge of the molecular pharmacology of receptors and molecular techniques used in pharmacology, but also your ability to apply the knowledge you have acquired from multiple lectures, collaborative learning sessions and practicals, to molecular pharmacology scenarios. The questions will be in the format of multiple choice questions and short answer questions and will be based on the material covered in the lectures, practical classes and collaborative learning sessions. Four quizzes will be held across the term. Individual marks will be provided via Moodle. Cohort feedback will be provided in the form of a post or podcast via the course Moodle page for each quiz.

Course Learning Outcomes

- CL01 : Apply knowledge of molecular pharmacology of drug targets to pharmacological problems
- CL02 : Describe the effect of genetic variability on drug action
- CL03 : Apply knowledge of molecular biology techniques to the design of experiments to test molecular pharmacology hypotheses
- CL04 : Record, analyse and/or draw conclusions from experimental data

Detailed Assessment Description

Quizzes will be held in tutorial class in weeks 3, 5, 8 and 10. Detailed information about this assessment will be provided on the course Moodle page.

Assessment Length

30 minutes per quiz

Submission notes

No short extension is available for this assessment task

Assessment information

It is prohibited to use any software or service to search for or generate information or answers. If such use is detected, it will be regarded as serious academic misconduct and subject to the standard penalties.

Journal Club

Assessment Overview

A 'Journal club' will be scheduled every second week (please note this may be subject to change due to public holidays). You will answer questions that guide you through the process of analysing and drawing conclusions from data presented in a research article which has used the molecular techniques taught in the collaborative learning session the week before. You will submit answers to these questions prior to each 'journal club'. At the end of term you will reflect on your critical analysis learning trajectory and nominate your "best" attempt at answering the questions for marking. You will receive feedback during class on how well you are analysing the journal article as part of the class discussion of the paper. A marking rubric will be used to evaluate your submission and written feedback on your reflection will be provided.

Course Learning Outcomes

- CL01 : Apply knowledge of molecular pharmacology of drug targets to pharmacological problems
- CL02 : Describe the effect of genetic variability on drug action
- CL03 : Apply knowledge of molecular biology techniques to the design of experiments to test molecular pharmacology hypotheses
- CL04 : Record, analyse and/or draw conclusions from experimental data

Detailed Assessment Description

Detailed information about this assessment will be provided on the course Moodle page

Submission notes

You will submit answers to the journal club questions prior to each 'journal club', no short extension is available for this part of the assessment task. A short extension of two days is available for the final reflection submission assessment task.

Assessment information

For this assessment task, you may use AI-based software to prepare prior to completing writing your assessment. Specifically you are permitted to use standard editing functions in word processing software – eg this includes spelling and grammar checking in the creation of your submission. You must not use any functions that generate or paraphrase passages of text, whether based on your own work or not.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Laboratory Notebook

Assessment Overview

You will record the details of each experiment performed during the practical classes, collect and analyse data, and draw conclusions from the data generated. You will be receiving formative feedback during practical classes and 2-3 times during the term your laboratory notebook will be graded. After each submission you will receive summative written feedback. A marking rubric will be used to evaluate the laboratory notebooks and provide feedback.

Course Learning Outcomes

- CL01 : Apply knowledge of molecular pharmacology of drug targets to pharmacological problems
- CL03 : Apply knowledge of molecular biology techniques to the design of experiments to test molecular pharmacology hypotheses
- CL04 : Record, analyse and/or draw conclusions from experimental data

Detailed Assessment Description

Detailed information about this assessment will be provided on the course Moodle page

Submission notes

A short extension of two days is available for this assessment task.

Assessment information

For this assessment task, you may use AI-based software to prepare prior to completing writing your assessment. Specifically you are permitted to use standard editing functions in word processing software – eg this includes spelling and grammar checking in the creation of your submission. You must not use any functions that generate or paraphrase passages of text, whether based on your own work or not.

End of session examination

Assessment Overview

The end of term examination will test not only your knowledge of the molecular pharmacology and molecular techniques, along with your ability to apply the knowledge you have acquired from multiple lectures, collaborative learning sessions and practicals to molecular pharmacology scenarios. The examination will be in the format of multiple choice questions and short answer questions. The questions will be based on the material covered in the lectures, practical classes and collaborative learning sessions. Cohort feedback will be provided once the exams are completed in the form of a post in Moodle.

Course Learning Outcomes

- CL01 : Apply knowledge of molecular pharmacology of drug targets to pharmacological problems
- CL02 : Describe the effect of genetic variability on drug action
- CL03 : Apply knowledge of molecular biology techniques to the design of experiments to test molecular pharmacology hypotheses
- CL04 : Record, analyse and/or draw conclusions from experimental data

Detailed Assessment Description

Detailed information about this assessment will be provided on the course Moodle page

Assessment Length

2 hours

Submission notes

No short extension is available for this assessment task.

Assessment information

It is prohibited to use any software or service to search for or generate information or answers. If such use is detected, it will be regarded as serious academic misconduct and subject to the standard penalties.

General Assessment Information

Detailed instructions regarding assessments for this course are provided on the course Moodle page .

For student information on results, grades, and guides to assessment see: <https://student.unsw.edu.au/assessment>

Grading Basis

Standard

Requirements to pass course

In order to pass this course students must:

- Achieve a composite grade of at least 50 out of 100
- Meet any additional requirements specified in the assessment details section and on Moodle.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Lecture	Introduction to Molecular Pharmacology
	Lecture	G protein-coupled receptors
	Tutorial	Introduction to Collaborative Learning Sessions. Molecular Techniques – BRET
	Laboratory	Introduction to practical classes & accurate record keeping
Week 2 : 19 February - 25 February	Lecture	Quantifying ligand binding
	Lecture	Quantifying drug action
	Tutorial	Journal Club
	Laboratory	Quantifying ligand binding (Receptor binding assay)
Week 3 : 26 February - 3 March	Lecture	G proteins
	Lecture	Signalling pathways
	Tutorial	Molecular Techniques – Confocal & Western Blotting
	Laboratory	Determining antagonist potency
Week 4 : 4 March - 10 March	Lecture	Turning off the signal
	Lecture	Subcellular control of signalling
	Tutorial	Journal Club
	Laboratory	Receptor signalling A: drug treatment
Week 5 : 11 March - 17 March	Lecture	Constitutive activity & inverse agonism
	Lecture	Biased signalling
	Tutorial	Molecular Techniques – AlphaScreen & Radial plots
	Laboratory	Receptor signalling B: protein separation
Week 7 : 25 March - 31 March	Lecture	Receptor Theory
	Lecture	Allosteric modulators
	Tutorial	Journal Club
Week 8 : 1 April - 7 April	Lecture	Nuclear receptors and transcription factors
	Lecture	Pharmacogenetics and pharmacogenomics
	Tutorial	Molecular Techniques – EMSA & Reporter gene assays
	Laboratory	Receptor signalling C: Western blotting
Week 9 : 8 April - 14 April	Lecture	Transporters
	Lecture	Catalytic receptors
	Tutorial	Journal Club
	Laboratory	Receptor signalling D: data analysis
Week 10 : 15 April - 21 April	Lecture	Ligand-gated ion channels
	Lecture	Orphan receptors
	Tutorial	Molecular techniques
	Laboratory	Pharmacogenetics

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

The times and locations of classes can be found on [myUNSW](#) under Class Timetable.

The expected engagement for all UNSW 6UOC courses is 150 hours per term. This includes lectures, tutorials, readings, and completion of assessments and exam preparation (if relevant).

Course Resources

Recommended Resources

Recommended resources for this course are provided on the course Moodle page.

Additional Costs

There are no additional costs associated with this course.

Course Evaluation and Development

Student feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback.

We use student feedback from myExperience surveys to develop and make improvements to the course each year. We do this by identifying areas of the course that require development from both the rating responses and written comments. Please spare a few minutes to complete the myExperience surveys for this course posted at the top of the Moodle page at the end of term.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Angela Finch				By appointment via the course e-mail address: PHAR3102@unsw.edu.au	No	Yes
	Lu Liu				By appointment via the course e-mail address: PHAR3102@unsw.edu.au	No	No

Other Useful Information

Academic Information

As a student of UNSW Medicine & Health you are expected to familiarise yourself with the contents of this course outline and the UNSW Student Code and policies and procedures related to your studies.

Student Code of Conduct

Throughout your time studying at UNSW Medicine & Health, you share a responsibility with us for maintaining a safe, harmonious and tolerant University environment. This includes within the courses you undertake during your degree and your interactions with the UNSW community, both on campus and online.

The [UNSW Student Code of Conduct](#) website provides a framework for the standard of conduct expected of UNSW students with respect to both academic integrity and your responsibility as a UNSW citizen.

Where the University believes a student may have breached the code, the University may take disciplinary action in accordance with the [Student Misconduct Procedure](#).

The [Student Conduct and Integrity Office](#) provides further resources to assist you to understand your conduct obligations as a student at UNSW.

Academic Honesty and Plagiarism

Academic integrity

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW staff and students have a responsibility to adhere to the principle of academic integrity, and ethical scholarship of learning is fundamental to your success at UNSW Medicine & Health.

Plagiarism, contract cheating, and inappropriate use of generative AI undermine academic integrity and are not tolerated at UNSW. For more information see the [Academic Integrity and Plagiarism toolkit](#).

In addition to the information you are required to review in your [ELISE training](#), UNSW Medicine & Health strongly recommends that you complete the [Working with Academic Integrity](#) module before submitting your first assessment task.

Referencing

Referencing is a way of acknowledging the sources of information that you use to research your assignments. Preferred referencing styles vary among UNSW Medicine & Health disciplines, so check your course Learning Management System (e.g. Moodle or Open Learning) page for information on preferred referencing styles.

For further information on referencing support and styles, see the Current Student [Referencing page](#).

Academic misconduct and plagiarism

At UNSW, academic misconduct is managed in accordance with the [Student Misconduct Procedure](#). Allegations of plagiarism are generally handled according to the [UNSW Plagiarism Management Procedure](#). Plagiarism is defined in the [UNSW Plagiarism Policy](#) and is not tolerated at UNSW.

Use of Generative AI and other tools in your assessment

UNSW has provided guiding statements for the [use of Generative AI in assessments](#). This will differ, depending on the individual assessment task, your course requirements, and the course stage within your program.

Your course convenor will outline if and how you can use Generative AI in each your assessment tasks. Options for the use of generative AI include: (1) no assistance; (2) simple editing assistance; (3) planning assistance; and (4) full assistance with attribution.

You may be required to submit the original generative AI responses, or drafts of your original work. Inappropriate use of generative AI is considered academic misconduct.

See your course Moodle (or Open Learning) page for the full instructions for individual assessment tasks for your course.

Submission of Assessment Tasks

Short extensions and special consideration

Short extension

Commencing in Term 1, 2024, UNSW has introduced a short extension procedure for submission of assessment tasks. Not all tasks are eligible, and eligible tasks have a predetermined extension length. UNSW Medicine and Health have set School-level extension lengths for eligible assessment tasks. See your course assessment descriptions for more information.

Students must check the availability of a short extension in the individual assessment task information for their courses.

Short extensions do not require supporting documentation. They must be submitted before the assessment task deadline. No late applications will be accepted.

Late penalties apply to submission of assessment tasks without approved extension.

Special consideration

In cases where short term events beyond your control affect your performance in a specific assessment task you may formally apply for [Special Consideration](#) through myUNSW.

UNSW has a **Fit to Sit rule**, which means that by sitting an examination on the scheduled date, you are declaring that you are fit to do so and cannot later apply for Special Consideration. Examinations include centrally timetabled examinations and scheduled, timed examinations and tests managed by your School.

Important information relating to Short Extension and Special Consideration is available [here](#), including eligibility for Special Consideration, circumstances where students with Equitable Learning Plans can apply for Short Extensions and Special Consideration, and the appeals process.

Examinations

Information about the conduct of examinations in your course is provided on your course Moodle page.

Timed online assessment tasks

If you experience a technical or connection problem during a timed online assessment, such as a timed quiz, you can apply for Special Consideration. To be eligible to apply you need to contact the Course Convenor and advise them of the issue immediately. You will need to submit an application for Special Consideration immediately, and upload screenshots, error messages or other evidence of the technical issue as supporting documentation. Additional information can be found on: <https://student.unsw.edu.au/special-consideration>

Other assessment tasks

Late submission of assessment tasks

UNSW has standard late submission penalties as outlined in the [UNSW Assessment](#)

[Implementation Procedure](#), with no permitted variation. All late assignments (unless extension or exemption previously agreed) will be penalised by 5% of the maximum mark per calendar day (including Saturday, Sunday and public holidays).

Late submissions penalties are capped at five calendar days (120 hours). This means that a student is not permitted to submit an assessment more than 5 calendar days (120 hours) after the due date for that assessment (unless extension or exemption previously agreed).

Failure to complete an assessment task

You are expected to complete all assessment tasks for your courses. In some courses, there will be a minimum pass mark required on a specific assessment task (a “hurdle task”) due to the need to assure clinical competency.

Where a hurdle task is applicable, additional information is provided in the assessment information on your course Moodle page.

Feedback on assessments

Feedback on your performance in assessment tasks will be provided to you in a timely manner. For assessment tasks completed within the teaching period of a course, other than a final assessment, feedback will be provided within 10 working days of submission, under normal circumstances.

Feedback on continuous assessment tasks (e.g. laboratory and studio-based, workplace-based, weekly quizzes) will be provided prior to the midpoint of the course.

Any variation from the above information that is specific to an assessment task will be clearly indicated in the course and assessment information provided to you on your course Moodle (or Open Learning) page.

Faculty-specific Information

Additional support for students

The university offers a wide range of support services that are available for students. Here are some links for you to explore.

- The Current Students Gateway: <https://student.unsw.edu.au>

- Academic Skills and Support: <https://student.unsw.edu.au/academic-skills>
- Student support: <https://www.student.unsw.edu.au/support>
- Student Wellbeing, Health and Safety: <https://student.unsw.edu.au/wellbeing>

Mind Smart Guides are a series of mental health self-help resources designed to give you the psychological flexibility, resilience and self-management skills you need to thrive at university and at work.

- Mind Smart Guides: <https://student.unsw.edu.au/mindsmart>
- Equitable Learning Services: <https://student.unsw.edu.au/els>
- Guide to studying online: <https://www.student.unsw.edu.au/online-study>

Most courses in UNSW Medicine & Health use Moodle as your Learning Management System. Guidance for using UNSW Moodle can be found on the Current Student page. Difficulties with Moodle should be logged with the IT Service Centre.

- Moodle Support: <https://student.unsw.edu.au/moodle-support>

The IT Service Desk is your central point of contact for assistance and support with remote and on-campus study.

- UNSW IT Service Centre: <https://www.myit.unsw.edu.au/services/students>

Course evaluation and development

At UNSW Medicine & Health, students take an active role in designing their courses and their overall student experience. We regularly seek feedback from students, and continuous improvements are made based on your input. Towards the end of the term, you will be asked to participate in the [myExperience survey](#), which serves as a source of evaluative feedback from students. Your input to this quality enhancement process is valuable in helping us meet your learning needs and deliver an effective and enriching learning experience. Student responses are carefully considered, and the action taken to enhance educational quality is documented in the myFeedback Matters section of your Moodle (or Open Learning) course page.

School-specific Information

Laboratory or practical class safety.

For courses where there is a laboratory or practical-based component, students are required to wear the specified personal protective equipment (e.g., laboratory coat, covered shoes, safety glasses) indicated in the associated student risk assessments. The student risk assessments will be provided on the course Moodle page and must be read and acknowledged prior to the class.

Master of Science in Health Data Science courses

Courses in the Master of Science in Health Data Science are hosted through [Open Learning](#). Additional resources are available on the [Health Data Science Student Hub](#).

School Contact Information

School guidelines on contacting staff:

Course questions

All questions related to course content should be posted on Moodle (or Open Learning) or as directed by your Course Convenor.

In cases where email communication with course convenors is necessary, we kindly request the following:

- Use your official email address for any correspondence with teaching staff.
- We expect a high standard of communication. All communication should avoid using short-hand or texting language.
- Include your full name, student ID, and your course code and name in all communication.

Our course convenors are expected to respond to emails during standard working hours of Monday to Friday, 9am-5pm.

Administrative questions

If you have an administrative question about your program of study at the School please submit your enquiry online at [UNSW Ask Us](#).

Complaints and appeals

Student complaints and appeals: <https://student.unsw.edu.au/complaints>

If you have any grievances about your studies, we invite you to address these initially to the Course Convenor. If the response does not meet your expectations, you may then contact the School Grievance Officer, Prof Nick Di Girolamo (n.digirolamo@unsw.edu.au).

For MSc. HDS students: School Grievance Officer, Dr Sanja Lujic (s.lujic@unsw.edu.au), Centre for Big Data Research in Health