

Welcome to PMCOL 337 (Winter 2023)

Experimental Procedures in Pharmacology

Course Coordinator: Dr. James Hammond
Instructors: James Hammond; Myron Zwozdesky
Teaching Assistants: TBA
Tuesdays or Thursdays 1:00 – 5:50 pm, MSB 9-68/9-65

Introduction

The **primary objective** of this course is to provide experience in fundamental pharmacological techniques and to illustrate some of the principles which are involved in drug action. A **secondary objective** is to provide instruction on best practices for assessing and reporting on experimental data.

As a student, you will gain most from this course if you ensure that you understand each procedure and the aims of the experiments to be undertaken.

Specific Learning Objectives

By the end of the course students will be able to:

- Perform pharmacological analyses using isolated tissue models (evaluated by lab performance, quality of data)
- Operate associated lab equipment with competency (evaluated by lab performance, quality of data)
- Understand the concepts of experimental variability and the complexities involved in using animals and freshly isolated tissues in pharmacological experimentation (evaluated by worksheets/lab reports, quizzes, poster presentation)
- Effectively organize, analyze, and report experimental data (evaluated by worksheets/ lab reports, poster presentation)
- Integrate conceptual knowledge from didactic lectures into the experimental domain (evaluated by worksheets/ lab reports, poster presentation, lab performance)

Expectations

It is expected that students will:

- Prepare for the lab by reading the materials posted on eClass **prior to** the respective lab
- Listen to, take notes as necessary and put into action verbal advice given by instructors/demonstrators
- Work with accuracy when following a protocol (e.g. pipetting small volumes, labelling drug vials)
- Work efficiently to ensure that the experiment can be completed in the time allotted
- Accurately record what happens during an experiment so that you can complete the lab report and the data can be used to derive class averages for statistical

analysis

- Be able to interpret results in the context of pharmacological knowledge
- Prepare laboratory reports in appropriate scientific language
- Be able to explain possible sources of experimental error
- Clean up all apparatus at the end of each class
- Actively engage in online discussions throughout the course
- Work effectively in a team - You can choose your own partners for the final poster presentation, or they can be assigned as necessary.

Experiments that are performed carefully and correctly usually work, but understand the concept of biological variation. Also understand that if your experiments fail in successive weeks, that is not biological variation and you should question and think about what you may be doing wrong.

Course Material

Protocols and worksheets for each lab will be provided on-line via eClass. You are strongly encouraged to use the discussion board on eClass to post and answer questions about the laboratory exercises. There will also be regular Q&A sessions hosted by the instructor and/or teaching assistants.

Recording and/or distribution of course materials: Audio or video recording, digital or otherwise, of lectures by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. All cell phones/smart phones are to be turned off while in the laboratory, unless otherwise instructed. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose (e.g. websites such as Study Blue) without prior written consent from the content author(s).

Assessment

The overall mark for the course will be determined based on the following components:

- Weekly prelab mini-quizzes to assess level of preparedness: 10%
- Midterm quiz based on prior pre-lab information sessions: 10%
- Weekly lab reports/worksheets: 55%
- Lab participation/performance: 10%
- Final poster presentation: 15%

Pre-lab Quizzes

A short quiz (~15 minutes) will be conducted at the start of each lab session, based on the material posted on-line for that lab session. Questions may cover aims of the experiment to be conducted, underlying theory, drugs to be used, calculations, expected results, etc.

Mid-term Quiz (Feb 28/Mar 2)

An ~1 hr quiz based on the pre-lab tutorials presented in prior sessions of the course. Questions may cover animal use ethics, literature searching, experimental bioassay theory and design, statistical analyses of experimental data, etc...

Lab reports/worksheets

For most of the lab exercises, students will work in randomly assigned groups of 2 or 3 which change from week to week. Each **lab group** will be required to complete a weekly lab report (9 in total) based on a provided worksheet which will contain questions pertaining to the lab such as goals of the experiment, experimental design, and drugs used. There will also be space to insert tables and/or graphs of your data and for your conclusions. **This worksheet should be used as the template for completing your report.** Quality of data obtained will be considered in allocation of the marks. Each report will be given a mark and n-1 of the marks will go towards the final 55%. This means that the lowest mark will be dropped when the final % mark is calculated. This does **not** mean that a student group can choose not to hand in a lab report. Missing reports, unless due to a justified absence (see below), will be awarded a zero. It is expected that all members of the lab group contribute equally to the preparation of the report, and this will be assessed via a co-submitted statement of contributions that all group members must sign. All students in the group will receive the same grade for a report, unless there is validated evidence of unequal participation in the preparation of the report or experimental work.

Completed reports must be submitted via eClass **by the specified deadline (usually just prior to the start of the next week's lab)**. Lab reports submitted late will be given a reduced mark of **20% per day** the report is late. However, if there is a valid (according to university policies) reason as to why you cannot submit the report on time, then let the instructor of that lab class know immediately, otherwise you will get a reduced mark.

Lab participation/performance

Laboratory participation/performance will be assessed by course instructors and teaching assistants. We will be looking for:

- following all laboratory safety protocols
- paying attention to the experimental protocol - e.g., applying drugs at specified time, using appropriate drug dilutions
- good technical skills such as tissue handling, ability to mount tissues in organ bath
- active participation in discussions that are integral to the course

The following will result in loss of marks:

- poor time allocation - for example spending excess time diluting drugs
- failing to follow the protocols
- lack of attention to experimental detail - e.g., failing to aerate isolated tissues, failing to wash tissues
- failing to work in an organized and safe manner - e.g., leaving sharps on the bench, failing to clear up after the laboratory, not wearing the required personal

- protection gear
- not posting results/material to eClass in a timely manner
- lack of participation in discussions

Final poster presentation

In the last session of the course (4th or 6th April 2023, depending on Section) students will present a poster on one of the lab exercises. The posters will be presented in pairs (you can choose your own partner). At least two weeks before the poster presentation each pair will be asked submit their top 3 choices as to which lab they want to present and we will try to ensure that as many people as possible get their first or second choice. The poster presentations will take place either in-person, or virtually via Zoom, depending on circumstances at the time, and each student must be prepared to talk about any aspect of the poster (introduction, methods, results, conclusions). The posters and presentations will be marked by faculty members and graduate students from the department.

Grading

Course grade will be based on the final cumulative percentage score assigned to students. The final percentage score will be determined by adding the weighted assessment components of the course as described above. Grade boundaries will be determined using the grade-mapping chart shown below:

Course Mark	Letter Grade
95 - 100	A+
90 - 94	A
85 - 89	A-
80 - 84	B+
75 - 79	B
70 - 74	B-
65 - 69	C+
60 - 64	C
55 - 59	C-
52 - 54	D+
50 - 51	D
0 - 49	F

Grades may be adjusted one step in either direction to account for exceptional grade distributions. Please note, students must score at least **50% on the final poster assessment** and have an aggregate mark of **50%** or more to pass the course (grade D).

Attendance

As the majority of the grade is derived through continuous assessment, it is important that you do not miss the in-person classes unnecessarily. Missing a class with no explanation will result in you receiving a **zero for the quiz and lab report** for that week and **loss of participation marks**. You will not be able to “borrow” data from other students to write up a lab report. Missing a class for a “genuine” reason will result in you receiving the class **average mark for the quiz and for that week** but **participation marks will be**

unaffected. You will not be expected to hand in a lab report but your “n” used to calculate the mark for your reports will be reduced.

Lab safety and etiquette

All students must bring a clean lab coat to the lab which must be worn at all times. Wear closed toe shoes and floor length pants (or equivalent). Safety glasses and gloves will be provided and must be worn at all times and food or drink must not be brought into the lab. Bags and coats can be left in the inner office and cell phones must be turned off during the lab classes.

Counseling and Clinical Services

Post-secondary education can be quite stressful, especially around exam time. The University of Alberta has services in place to help students navigate through the challenges of university education. The mental health of our students is a priority at the University of Alberta. A list of available services and support can be found at <https://www.ualberta.ca/current-students/wellness/mental-health>

Counseling and Clinical Services aims to help students with personal, social and academic issues. Common issues that can be addressed include depression, anxiety, self-harm, grief, disordered eating, relationship problems, perfectionism and adapting to University life. Initial consultations and all services (with the exception of group therapy) are free of charge. Please visit <https://www.ualberta.ca/current-students/counselling> for further information.

The Academic Success Centre

The Academic Success Centre <https://www.studentsuccess.ualberta.ca> provides services to help students academically and to support a successful academic experience. They help students develop skills that help to address exam preparation and exam writing anxiety, effective study habits, note taking and time management.

Student Accessibility Services

Student Accessibility Services (SAS) <https://www.ualberta.ca/current-students/accessibility-resources> serves students with documented disabilities and provides support to ensure that they achieve their full potential. They serve students who have mobility, vision, hearing and physical and mental health issues.

If a student has issues of any sort that will affect their success when writing exams, it is strongly suggested that they contact SAS and register with them. This will then initiate a process by which the course coordinator and SAS work together to make sure that the appropriate accommodation for examinations can occur. Registration with SAS should occur before any examinations take place.

SAS is in the best position to assess a student’s needs and mutually agree upon the best course of action for the student in order to maximize their success when writing examinations.

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The course coordinator will not be able to make ad-hoc decisions to defer exams or to change weighting of exams for students who have a disability but have not registered with SAS. Additionally, if a student writes and completes an exam, it will not retroactively be reassessed in light of new information about mental or physical health issues subsequently provided to the instructor.

Please note, as stated in the University calendar, should a student write an exam, hand in the paper for marking, and later report extenuating circumstances to support a request for cancellation of the paper and for another exam, such request will not be entertained. Any student who requests a cancellation of their paper and subsequently applies for or obtains an excused absence by making false statements will be liable under the Code of Student Behaviour.

Academic Integrity:

"The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.governance.ualberta.ca) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University."

All forms of academic dishonesty are unacceptable at the University. Any suspected offence will be reported to the Faculty of Science. Anyone who is found in violation of the Code of Student Behaviour may receive a sanction. Typical sanctions include conduct probation, a mark reduction or a mark of 0 on an assessment, a grade reduction or a grade of F in a course, a remark on the transcript, and a recommendation for suspension or expulsion.

Students are expected to familiarize themselves with the [Academic Integrity](#) resources (covering the topics of cheating, collaboration, plagiarism, and substantial assistance) on the website of the Office of the Dean of Students.

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced in class.

Contact details

Dr James Hammond will have virtual office hours from 9:00-10:00 am Monday, Tuesday, Wednesday, and Thursday, starting on Jan 17th (Zoom link provided on the course eClass site). If you wish to meet with any of the instructors or teaching assistants outside of this time, please email for an appointment.

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