

**PHARMAC 3B06 A/B: Methods in Pharmacology**  
Fall 2023/Winter 2024  
Dr. Luke Janssen

**GENERAL OVERVIEW:** PHARMAC 3B06 gives the students an opportunity to learn pharmacology by **doing** it.

Fall Semester: During the first five months of the course, they learn within the controlled environment of the teaching lab, developing basic lab bench skills and forming five tight collaborative research teams (3-5 individuals in each, depending on enrollment numbers). Those five teams rotate through five distinct lab exercise modules specifically designed to explore hands-on many of the pharmacological/physiological concepts that they are concurrently studying in other courses, particularly PHARMAC 3A06 and to a lesser extent BIO 3P03 (Cell Physiology) and BIO 3U03 (Animal Physiology).

Winter Semester: During the final three months, those five research teams are sent into the real world, each going to a different research lab supervised by faculty colleagues to flex and hone those research muscles within a short Discovery Project in an actual research lab environment. Altogether, the goals of those lab exercise modules and the Discovery Project is to not only increase their knowledge base (particularly vis-à-vis pharmacology and cell physiology) and develop hands-on lab experience and skills, but to also teach the students how to think, perform and write like a scientist in a lab-bench setting, both as an individual and as part of an interactive research team.

**SPECIFIC DETAILS:**

(1) Five exercise modules: each are modeled around or framed as a pharmacological/physiological study done using a distinct research methodology as well as basic lab skills (experimental design; pipetting; preparation of reagents; data collections and analysis; etc.). Each is written up in the format of a typical scientific paper which would be submitted to a scientific journal, and are graded in part as a Reviewer/Editor might critique such a submission.

Those five modules include:

- measuring agonist/antagonist interactions by measuring contractions in isolated muscle tissues
- measuring receptor-ligand interactions using radioligand binding of membrane extracts
- identifying an active compound within a library of 2 million compounds using high throughput screening in cultured cells
- identifying and characterizing an inhibitor (channel blocker) using patch clamp electrophysiology in enzymatically dissociated cells
- identifying and characterizing three active inhibitors within a library of 80 compounds using an enzyme assay

(2) Discovery Project: each project is unique and uses distinct methodologies, as required by the faculty colleague in whose lab they are recruited. The team of students is expected to be more independent, designing (in part) the experimental protocol and methodology,

carrying out the experiments, and collecting/analyzing the data. The students then present their work in the manner in which scientists typically present their work for peer feedback at scientific conferences: as a typical scientific poster, as well as a 20-minute oral presentation followed by questions from their audience of peers.

## EVALUATION

### Part 1: Scheduled Lab Exercises

Learning objectives and quizzes	15%	[15 LOs and 5 quizzes]
Laboratory performance	15%	[evaluated by the five TAs]
Laboratory reports	20%	[five in total]

### Part 2: Discovery Project

Individual poster	10%	
Group oral presentation	25%	[evaluated by the TAs]
Supervisor's evaluation	10%	
Group evaluation	5%	[members of group evaluate each other]

## CONDUCT EXPECTATIONS

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the “Code”). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, whether in person or online.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students’ access to these platforms.

## ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. The academic credentials that you earn are rooted in the principles of honesty and academic integrity. **It is your responsibility to understand what constitutes academic dishonesty.**

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy. Important and helpful information can be found here.

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g., the submission of work that is not one's own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

## **AUTHENTICITY/PLAGIARISM DETECTION**

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty. Students who do not wish to submit their work through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g. on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com, please go to [www.mcmaster.ca/academicintegrity](http://www.mcmaster.ca/academicintegrity).

## **ACADEMIC ACCOMMODATIONS**

### *For Students with Disabilities*

- Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or [sas@mcmaster.ca](mailto:sas@mcmaster.ca) to make arrangements with a Program Coordinator. For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

### *For Religious, Indigenous, or Spiritual Observances (RISO)*

- Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students requiring a RISO accommodation should submit their request to their Faculty/Program Office normally within 10 working days of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructor/coordinator as soon as possible to make alternative arrangements for classes, assignments, and tests.

## **COURSES WITH AN ONLINE ELEMENT**

Some courses may use online elements and platforms. Students should be aware that, when they make use of these platforms, information such as first and last names, usernames for the McMaster email accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

## **COPYRIGHT AND RECORDING**

Students are advised that lectures, demonstrations, performances, and any other course materials provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical, and artistic work, including lectures by University instructors. Students must not disseminate these materials to others not registered in the course, or post to third-party websites. The recording of lectures, tutorials, or other methods of instruction may occur during a course by the instructor for instructional purposes; students may make recordings for the purpose of personal

study, but these must not be disseminated in any form. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the coordinator if this is a concern for you.

## **EXTREME CIRCUMSTANCES**

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, Avenue to Learn, Microsoft Teams and/or McMaster email.

## **HEALTH AND WELLNESS RESOURCES FOR STUDENTS**

As a signatory on the Okanagan Charter, McMaster University is committed to enhancing mental health and wellness and provides various resources for students to manage their well-being. Students are encouraged to seek support as necessary; the following are several campus- and community-based resources that you may find helpful. For more resources and additional information, please visit <https://wellness.mcmaster.ca/resources/>

### ***ON-CAMPUS RESOURCES***

- **Student Wellness Centre:** Provides counselling, medical services, wellness education, guided self-help, and other relevant resources. PGCLL 210; 905-525-9140, x27700; <https://wellness.mcmaster.ca>
- **Sexual Violence Support:** An on-campus resource where students, staff, and faculty of all backgrounds and social identities can find support and information about sexual, intimate partnership or family violence. UH 104; 905-525-9140 x20909; <https://svpro.mcmaster.ca>
- **Faculty/Program Office:** Feel free to contact an Academic Advisor in your Faculty/Program Office who can connect with academic advising and connect you with other resources.

### ***OFF-CAMPUS RESOURCES***

- **Good2Talk:** Free, confidential helpline providing professional counselling and information and referrals for mental health, addictions and well-being to post-secondary students in Ontario, 24/7/365; 1-866-925-5454; <https://good2talk.ca>
- **Big White Wall:** Online peer-to-peer chat-based service that provides mental health and wellbeing support, 24/7/365. <https://www.bigwhitewall.com>
- **SACHA (Sexual Assault Centre - Hamilton Area):** Confidential, anonymous 24-hour nonjudgmental telephone support for adults who have experienced sexual violence. 905-525-4162; <http://sacha.ca>

If you have immediate safety concerns for yourself or others, call **Campus Security** who will respond with the **MSU Emergency First Response Team (EFRT)** at 905-522-4135 or call 911 if you are off campus.

## **LAND ACKNOWLEDGEMENT**

McMaster University recognizes and acknowledges that it is located on the traditional territories of the Mississauga and Haudenosaunee nations, and within the lands protected by the Dish With One Spoon wampum agreement.

## **NOTE**

*The instructor and the university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of students to check their McMaster email and course websites weekly during the term and to note any changes.*