

**PHARMACOLOGY 7700 –
RECENT DEVELOPMENTS IN PHARMACOLOGY**

(revised 9/8/2002)

I. COURSE DESCRIPTION:

The course is taught in a journal club format in which participants will give an oral presentation and critique on recent papers relevant to research in a carefully selected field of cellular and molecular pharmacology. Additionally, students are required to prepare written critiques of at least three sets of papers that are presented by other students during the semester. All Department of Pharmacology faculty and staff are encouraged to attend. Participation by Pharmacology pre-doctoral students is required during each semester of their tenure in the graduate program, up until the time that they begin writing their dissertation (i.e., students enroll through their fourth year in the program). Students working towards an M.S. degree are required to enroll during two semesters of their program.

II. COURSE OBJECTIVES:

- A. Learn to critically evaluate the scientific literature.
- B. Understand when a paper contributes substantial new information to a given field.
- C. Development of both oral and written communication skills.
- D. Encourage the habit of asking questions during oral presentations and participating in scientific discussion.
- E. Promote interaction between the faculty and students in an informal atmosphere in which students should gain insight into the approach different faculty take toward scientific problems.

III. GRADING POLICY:

A letter grade will be given based on the oral presentation, the three written critiques on presentations given by other students during the semester, and discussion during class. The course coordinator will meet with the presenting student within one week to review the presentation. Written critiques will be evaluated based on the guidelines described below. Grades for Winter Semester fourth-year students will be based on how well they mentor first-year students and how well they lead discussion of papers being presented.

IV. GUIDELINES FOR STUDENT PARTICIPATION:

- A. All students will register for PHC **7700** for one credit per semester during the Winter semester of Year 1 and during both semesters of Years 2, 3, and 4. The grade for this course will be based on attendance, a limited number of written critiques of the papers being presented, an oral presentation, and class discussion. To promote discussion, all students should be prepared to discuss various aspects of the papers in particular and the field in general during the time of the presentation.
- B. All students are expected to attend every journal club. If a class must be missed, the student must provide a reasonable explanation to the course director. If more than two (2) classes are missed in any single semester for any reason, the student must write an additional critique as a make-up for an incomplete.
- C. First-Year Students:
 1. *Objectives:*
 - a. Begin to learn how to critique scientific papers.
 - b. Initiate an understanding of what a new advance in a particular field is.
 - c. Develop scientific writing and communication skills.
 - d. Develop the habit of asking questions during scientific presentations and discussions.
 - e. Interaction with faculty and senior students.
 2. *Participation:*
 - a. *Fall Semester:* Due to credit limitations, students do not register for PHC 7700. However, all students are expected to attend, read journal club papers, participate in discussion, and write three (3) critiques of papers that are presented.
 - b. *Winter Semester:* Students register for PHC 7700. In addition to participation as described for the Fall Semester, First-year students will also make one journal club presentation. First-year students will pick a fourth-year student as a mentor. The choice will be made by picking a name at random. The mentor will help the student to prepare for and to practice his/her presentation.
 3. The papers to be presented will be made available one week prior to the date of the presentation. Students will prepare one to two page critiques of three of the sets of papers that are presented during each semester. The overall outline of the critique should be based on a series of standardized questions (see below). Critiques will be due immediately prior to the presentation. Each critique will be given a letter grade by the course coordinator. Although any one student may turn in more than three critiques if he or she so desires, the final grade will be determined from the best three critiques. Less than three critiques will not be considered a passing effort.

4. Students will make one oral presentation during the second semester. Papers to be presented should be chosen in conjunction with the course director as outlined below.

D. Second-Year, Third-Year, and Fall Semester Fourth-Year Students:

1. *Objectives:*
 - a. Learn to critically evaluate the scientific literature.
 - b. Understand when a paper contributes substantial new information to a given field.
 - c. Continue development of scientific writing and communication skills.
 - d. Reinforcement of the habit of asking questions during the presentation.
 - e. Interaction with faculty.
2. The papers to be presented will be made available one week prior to the date of the presentation. Students will prepare one to two page critiques of three of the sets of papers that are presented during each semester. The overall outline of the critique should be based on a series of standardized questions (see below). Critiques will be due immediately prior to the presentation. Each critique will be given a letter grade by the course coordinator. Although any one student may turn in more than three critiques if he or she so desires, the final grade will be determined from the best three critiques. Less than three critiques will not be considered a passing effort.
3. If second- or third-year students wish to have a fourth-year student as a mentor during the Winter semester, they can choose one that is available.
4. Students will make one oral presentation during each semester. Papers to be presented should be less than 12 months old although an older review article may be included as part of the presented work. Each student is strongly encouraged to seek out faculty members working in the subject area of the paper or in a related area for questions and guidance. The evaluation of the presentation will be reviewed with the student by the course coordinator within one week after the presentation.

E. Winter Semester, Fourth-Year Students:

1. Students are not required to write critiques or to make a Journal Club presentation during their last semester as a registrant in PHC 7700. Fourth-year students are expected, however, to be active in discussion of presented papers.

2. Students will choose a fourth-year student at random as their mentor. Mentors are responsible for helping the student in preparation of an practice of their presentation. The mentor will also be responsible for leading the discussion of the papers in Journal Club.
3. Students will also be assigned to lead the discussion of Journal Clubs that do not require mentors.
4. Fourth-year students will make an oral presentation based on their own research. The presentation should include an introduction that provides background and significance, a statement of the specific aims of the dissertation project, a presentation of some of the results that have been obtained, and a summary with an indication of what else is being done on the project. The presentation should be informal. Overheads may be used. This activity will allow the more junior students to learn what work their peers are doing and will provide fourth-year students with the opportunity to practice presenting their own work.

V. GUIDELINES FOR THE PREPARATION OF A WRITTEN CRITIQUE:

The following questions and issues should be addressed in the written critique: (Note that every opportunity to have your writing evaluated should be taken very seriously. As such, care should be taken to avoid misspelling, sloppy syntax, or poor reasoning.)

A. First-Year Students:

1. What is the overall hypothesis of the papers? (i.e., Why did they do the work?)
2. Briefly describe the experimental approaches the investigators used to test their hypothesis. In your opinion, are the methods and experiments appropriate to investigate this hypothesis? Why?
3. Do you believe that the data support or refute the hypothesis proposed in this paper? Why?
4. Are there other experiments you would have included to these the authors' hypothesis in this paper?
5. Does the paper make a substantive contribution to the field? What is the new insight?

B. Second-Year Students and Above:

1. Provide a brief summary of the paper, which includes the hypothesis, experimental approach used to test the hypothesis, and the strengths and weaknesses of the study. Do not simply copy the abstract!
2. In your opinion, are the methods adequate to test the proposed hypothesis? Explain.
3. Do the authors use statistical methods to analyze their data? If not, should they have been used? If so, are the methods appropriate for the study?

4. What experimental controls are used and are they appropriate for the study? Should additional controls have been included?
5. Overall, do you believe that the data support or refute the proposed hypothesis? Explain.
6. Are there other experiments you would have included to test the authors' hypothesis? If so, provide expected results.
7. Are the interpretations and conclusions in the discussion section of the paper supported by the data?
8. Does the paper make a substantive contribution to the field?
9. Are the results novel?
10. Is the journal appropriate? Why?
11. If you were a reviewer, would you accept, request revisions, or reject this manuscript? Why?

VI. GUIDELINES FOR SELECTION OF A PAPER FOR THE ORAL PRESENTATION:

Three papers from a given research area will form the basis of an oral presentation. A review article of the field is highly recommended, coupled with two recent papers on the topic of interest. The topic should be chosen in conjunction with the course director to ensure broad coverage of a range of research foci.

Please do not choose papers with "major problems". Papers that clearly do not have appropriate controls or have obvious misinterpretations or improper analyses are not acceptable for journal club. A clear understanding of the data, the methodology, and the field of interest is required for a complete journal club presentation.

The papers being presented should be made available to all students at least one week prior to the presentation. A copy of the papers' abstracts should be distributed to all faculty and students at that time.

VII. GUIDELINES FOR THE PREPARATION OF AN ORAL PRESENTATION:

Oral presentations should consist of the following:

- A. A brief introduction of the studies and the field of interest. Include the title of the papers, who performed the studies, and a one or two statement overview of the hypotheses or the overall objectives.
- B. A presentation of background material. You should assume that your audience knows nothing about this particular research field. You should, therefore, provide enough background material to familiarize everyone with the previous work that impacts the study that you are presenting. Careful selection of a review article is important to accomplish this. You may also use the papers cited in the Introduction of the actual

research articles as a guideline for preparing this portion of the presentation. It will be necessary to review some experimental data from these background papers as the results may have a significant impact on the study being presented.

- C. A brief overview of the methods used in the study.
- D. Present the results, giving the authors' conclusions from each experiment and explain how the results from each experiment lead to the subsequent experiment. Do not assume that the audience is familiar with all the techniques used in the study. Explain how the data were generated and how they are presented. This is a good time to criticize experimental design, to point out alternative approaches that you think would provide clearer interpretations, or to criticize the authors' conclusions from a particular experiment.
- E. Discuss how the papers contribute to the field of interest. Are these major advances or only minor contributions. Do you agree with the authors' overall interpretation? If not, why not and how would you interpret the data?
- F. What questions remain? Discuss the future direction of these and related studies.

Remember, as speakers in this forum, your goal is to

1. Describe a field of research.
2. Analyze current studies related to this field.
3. Discuss the impact of the studies on the field.

Ideally, other students (and faculty) will learn a great deal about a given topic having had someone else lead them through the relevant research.