

PHRM 373

Readings in Pharmacology

Spring, 2021 Syllabus

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Class Time: Monday, 2:45 – 4:45 PM

Location: Given B-307

Course Description:

The goal of this course is to use an active learning approach to critically review recent, high impact primary articles in pharmacology. The format of this graduate level readings class is *student-led, team based* critical analysis of a recent journal article in the field of Pharmacology. Each week, one member of the class will be the Designated Leader (DL) and will lead the discussion of an article of their choosing. This will give the class leader an opportunity to deepen their knowledge in an area of particular interest to them, and for the rest of the class to expand their knowledge in a current topic of pharmacology research.

Overall format:

Before class:

1. Designated Leader Tasks:

- a. At least TWO WEEKS prior to class the leader for the next class will send the course instructor an email identifying an article. It is CRITICAL that you do this on time so that I have enough time to look at the article and approve it. The two week time window gives us enough time to select new articles if necessary.
- b. Choose an article that you are interested in and that you think could be interesting to the group. Everyone will present one basic research article and one clinical trial article. You can do them in any order you like. Whether basic research or clinical trial, the article should have *a clear pharmacology focus*. Your task will be made easier if the article has clear, well-presented figures and tables, so take time selecting the articles you will present. See Article Selection Guidelines below.
- c. Read the article carefully and be ready to lead a discussion of all aspects of the article, from providing background (introduction) to methods to discussing each figure in detail. The DL should also be able to summarize the author's main Discussion points and to provide leadership in critically discussing the article with the class.
- d. All presentations should use a standard format as follows:
 - i. Prepare slides as follows:

1. Title of article along with the following questions:
 - a. How can the title be restated in your own words?
 - b. Based on the title, what are the authors' goals/claims?
 - c. What are some potential experimental approaches?
 2. Data figure. For multi-component figures, consider making a separate slide for each component. Please include the relevant part of the authors' figure legend or, if you feel it necessary, a cut/paste of the relevant part of the Results section.
 3. Include Methods figure slides as appropriate. These could be from the paper or elsewhere and can be used as tools for the DL to help explain the methods used, especially if they are not common lab methods.
2. Class member tasks:
- a. Please do read/scan the article in advance. Read on the abstract and intro and methods, but just scan the results and discussion. The idea is to have some idea of what the article is about, but to hold off on detailed exploration of the results and discussion until class.

During class:

1. Overall philosophy and goal:
 - a. The DL: As a DL, your job is to know everything about the paper. If someone asks about some aspect of the methods or technique, you should be able to give them an answer. If someone asks about some aspect of how data is analyzed or presented in a figure, you should be able to describe it. In other words, a big part of presenting a paper is taking the time to look up methods, analysis and statistical techniques and generally understanding what is presented in a deep way. A good way to ensure that you are hitting the right level is to imagine that you are preparing to explain the paper in detail to the author.
 - b. Class participants: Your job is to participate. Monitor your own activity. Ask questions. Contribute to the discussion. If you notice that you are not contributing, do something about it. Remember, there are absolutely no wrong questions or comments. Period. I would much rather have you explore your thoughts than hold back because you are concerned that they are not valuable or correct. You will be surprised at how many of your classmates, and me as well, have the exact same "stupid" question in mind at the same time as you!
2. The DL will open the discussion by telling us why they chose the article. For example, it could be that you have an interest in the subject area, or a particular technique, or even that the title sounded interesting, prompting you to want to learn more. The DL will also clearly state the article's relevance to pharmacology.

3. Each class member (ending with the DL) will rephrase the title to identify expected outcomes or simply state what they think the article might be trying to do. If you feel that it's pretty obvious based on the titles or what students before you have said, comment on anything else you'd like. For example, you might be curious about something that you hope the article might address, or you might be concerned that the study covers a certain population, or anything else. In other words, we will come to a group decision on what we expect the article to cover/conclude based on the title alone. Frankly, this exercise is a bit contrived, but you'll find that it's a nice and relaxing way to get us all in a conversational mode!
4. The DL will then lead a review of the article:
 - a. The DL will present the scientific background. This should derive from but not copy from the introduction. Keep this as brief but please be sure to cover the key concepts. Be sure to explicitly state the hypotheses posed by the authors. Describe how you think the paper is intended by the authors contribute to the field.
 - b. The DL will lead a discussion the data, using their prepared slides. As a class, we will go through each figure, trying to figure out what the authors are trying to do. This will be done with guidance of the DL, who will already have read the paper. During this discussion, the DL should be ready to describe the experimental methods used for each figure.
 - i. The DL will put up the first slide and make a very brief statement about what it is about.
 - ii. We will then spend a few minutes (timed by me) to privately look over the slide and start thinking about it. You can also read the relevant part of the text in the results section at this time.
 - iii. We will then begin our discussion. The best and most fair way to do this is for each member of the group to choose a figure and describe the data within the figure in concrete terms and *without interpretation*. It should be akin to describing the figure to someone who cannot see it. Just focus on the broad strokes. Please be sure to contribute to this! Generally papers have more than five figures, so everyone should do at least one.
 - iv. Next, the whole group begins a discussion of what the data means. We will focus on details, including the experimental methods and the meaning and potential relevance of the data. In particular, we will discuss whether the sample size and statistical methods are appropriate and, based on that, what can be concluded from the figure. Questions that arise during our discussion should first be addressed by the DL. The hope is that the DL will have some insight. However, *the DL is not expected to know everything!* If we cannot answer a question with the DL's help, we can turn to the internet before moving forward.
 - v. Rinse and repeat for each figure. In each case, at end link the current figure with the previous one. If everyone truly did not read the article

beforehand, it will be interesting to speculate on what the next figure might be. That way we can compare our approach to that of the authors!

5. Summarize the article.

- a. First, the DL will very briefly summarize the main points made by the authors in the Discussion.
- b. Next, the class as a whole will discuss those points.
- c. Finally, the class will come up with a brief statement of the paper's take home message and will discuss how well that aligns with our initial expectations based on the title.

Article selection guidelines:

- i. Please choose articles that are of interest to you. Don't worry too much about the article being "high impact". The reality is that it's pretty much impossible to really know what will and will not be considered high impact 10 or 20 years into the future.
- ii. Articles can be selected from any peer-reviewed scientific journal, not just those focused on Pharmacology, but they should have a clear pharmacology focus (i.e. describes the article's relation to pharmacokinetics, pharmacogenetics, pharmacoepidemiology, clinical pharmacology (for example drug trials), a subject related pharmacology (for example neuro or cardiovascular), or some combination of these or other aspects of pharmacology.
- iii. The focus should be on new (the past year or two) articles, however if there is a particularly impactful older article that you are interested in, please feel free to choose it.
- iv. Please choose one article with a primary focus on basic research, and another article with a focus on clinical drug trials. They can be on the same general theme (for example if you are interested in therapeutic approaches for a particular disease) or can be completely different. You can present your articles in any order you like.

Grading: Each student will receive one grade per class, ranging from A to C. The final grade is the average of the individual class grades. Grading criteria are as follows:

1. DLs are graded on level of preparedness for leading the discussion. This includes knowledge of background and methods, as well as level of preparation for discussing the data.
2. **This class will only be a success if everyone participates. It is not at all like a lecture format where passive observation is acceptable.** You will be graded on your active participation. Being insightful but not communicating that by remaining silent will not get you far. Presenting your thoughts, making arguments, asking questions will get you an A. Asking questions that you think are probably stupid will likely get you an A+ since they're the ones that everyone else wants to ask too. So, being engaged will get you an A, while being quiet and disengaged could lead to a C or even an F (if you really don't engage at all). Remember, there is no right and wrong with any of this. The idea is to jump in. In other words, if you throw caution to the wind and let yourself contribute to and enjoy the conversation you will most likely get an A in this course.
3. At the end of each class you should record your grade for the week based on your perceived level of participation. Make some notes to justify your self-assessment. On Feb 10 and March 30, I will meet with each of you in private to discuss whether your perceived assessment and my assessment match. That way you will have solid feedback as to your progress and will have plenty of time to make adjustments to ensure an outstanding result for yourself.

Class schedule: There are 7 students enrolled and 15 days of classes. Each student will lead two class sessions, one with a basic research article and one with a clinical trial article. We will devote the remaining 1 day of classes to analyzing two review articles as a group.

Schedule

Date	Designated leader	Article type (res or rev)	Article PMID and title	My self-assessment for this week
Feb 1				
Feb 8				
Feb 15				
Feb 22				Progress assessment day
March 1				
March 8				
March 15				
March 22				
March 29				Progress assessment day
April 5				
April 12				
April 19				
April 26				
May 3				
May 11				