

COURSE DIRECTORS:

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I. GENERAL

This course is taught in a journal club format; each week a student presents an oral critique of a recent paper relevant to research in the broad area of cancer biology. The papers presented are selected in consultation with Cancer Biology faculty. Students are required to critique at least two papers each semester (of these, one will be presented orally during the year). Participation by Cancer Biology pre-doctoral students is required each semester of the first four years of their tenure in the graduate program. All Cancer Biology faculty, post-doctoral fellows, and staff are encouraged to attend; this journal club is open to all interested students and researchers at Wayne State University.

II. COURSE OBJECTIVES

The educational objectives of Recent Developments in Cancer Biology are:

- A. to learn to critically evaluate the scientific literature;
- B. to develop both oral and written communication skills;
- C. to develop the habit of asking questions during oral presentations and participating in scientific discussion;
- D. to broaden the student's knowledge of current research in Cancer Biology;
- E. to gain insight into the approach different researchers take toward scientific problems by promoting scientific interaction in an informal atmosphere.

III. GUIDELINES FOR STUDENT PARTICIPATION

A. General

Pre-doctoral Cancer Biology students are required to participate in CB7700 during the first four years of their tenure in the Cancer Biology Graduate Program.. Once a year each student is required to prepare and deliver an oral presentation of a selected paper. Papers to be critiqued are selected at the start of the semester through recommendations by Cancer Biology faculty members. All students are required to submit two written critiques per semester; however, students presenting oral critiques will be required to submit only one written critique that semester. To assure that each sponsoring faculty receives a similar number of written critiques, students will be assigned papers they will be required to analyze and critique. It is anticipated that each student will have the first assignment in the first part of the semester and the second assignment in the latter part of the semester. All students should be prepared to discuss papers during the oral presentation. For each presentation, we will have 2-3 assigned discussants; however, all students will be encouraged to participate in discussion and will receive extra discussion points. In addition, all students will be asked to evaluate the oral presentation and offer constructive criticism on a standardized form.

B. Guidelines for oral critiques

The student will initiate preparation for the oral presentation by contacting the faculty member who they have selected so that a paper can be chosen. The student will arrange to meet with the faculty member at least one week before the presentation to discuss the paper. In addition to meeting with the sponsoring faculty, students will be encouraged to seek the biostatistics expertise from Dr. Seongho Kim (Biostatistics Core, KCI). Even if the student has no specific questions regarding the paper, both the sponsoring faculty member and the biostatistician can provide insight that may help more fully understand the broader significance of the paper. Importantly, having access to biostatistics expertise will be invaluable to the analysis of the paper in terms of design, scientific rigor and execution of scientific objectives. Students are encouraged to take advantage of Dr. Kim's expertise while preparing their presentations. Oral presentations should be approximately 40 minutes in length (to allow time for discussion) and must consist of the following.

1. **Introduction:** Introduce the study including the paper title, the authors, their affiliations, and a brief statement of the hypothesis (es) and/or overall objective(s) (i.e., what is(are) *the question(s)* being addressed?).
2. **Background:** Briefly summarize what is known and identify what specific gaps in current knowledge this study proposes to fill (i.e., why is it important to know *the answer(s) to the question(s)*?). Provide enough background material to familiarize everyone with the previous work that impacts upon the study you are presenting (it is safest to assume that the audience knows little or nothing about the particular research field). Refer to the references cited in the paper's Introduction as a guideline for preparing this portion of the presentation. If previous results have a significant impact on the paper being critiqued, review some experimental data from the background papers in the presentation.
3. **Experimental Design and Methods:** Briefly overview the methods (i.e., what information do they provide?) and experimental design (i.e., how are the methods used to test the hypothesis (es)?). Assess their appropriateness to answer *the question(s)*. If any of the methods are uncommon or difficult to understand, provide a brief description of how they work.
4. **Results:** Present the results. For each experiment, give the author's conclusions and how the results lead to the subsequent experiment. Indicate which methods were used to generate the data and how the figure/table presents the information. If there are too many results to present in the context of a 40 minute critique, present the key results and, if possible, other results can be summarized. This is a good place to criticize how the data are presented, the author's conclusion from a particular experiment, or the experimental design (are appropriate controls included? Are biostatistical analyses correctly implemented? Would another approach give a clearer interpretation?).
5. **Summary:** Summarize the key results and how they provide *the answer(s) to the question(s)*. Do you agree with the author's overall interpretation? If not, why not and how would you interpret their data?
6. **Discussion:** Discuss how this study impacts on work from other laboratories in the field (i.e., how do the results fit into the "big picture"?). Discuss the future direction of these studies (i.e., what are the implications of this work?). The discussion is where input from the faculty member who recommended the paper will be especially valuable.

C. Guidelines for written critiques

Students presenting an oral critique prepare written critiques of one additional paper presented during the semester. Students not presenting an oral critique prepare written critiques of two papers presented during the semester. **Each critique should be typed double-spaced and two pages in length.** All written critiques are due *immediately prior to* the presentation.

All critiques should have a cover page with the paper title, authors, journal reference, student's name, and date submitted. The following sections indicate what information should be included in the written critique.

- a. State the hypothesis(es) and/or overall objective(s) of the paper. Identify what specific gaps in current knowledge this study proposes to fill.
- b. *Summarize key results.* Do you agree with their interpretation? If not, why not and how would you interpret the data?
- c. Overall, do you believe the data support or refute the hypothesis(es)? Explain.
- d. Are the interpretations and conclusions in the discussion section of the paper supported by the data?
- e. Discuss the future direction of these studies (*i.e.*, what are the implications of this work?).

Examples of issues that you may want to address:

- a. What experimental controls are used and are they appropriate for the study? Should additional controls have been included?
- b. Are there other experiments you would have included to test the authors hypothesis(es)? If so, indicate why the results would be more relevant.
- c. If you were a reviewer, would you accept, request revisions, or reject the manuscript? Why?
- d. Do the authors use statistical analyses? If not, should they have been used? If so, are the analyses used appropriate for the study?

Final notes:

- a. Only include methods if they are relevant to your criticisms.
- b. Don't be afraid to discuss the good aspects of the paper.

IV. GRADING POLICY

A. Classroom attendance policy

Due to the participatory nature of this class, all students are expected to attend as many classes as possible and arrive in class at the start of the presentation. If you will be absent from more than 2 classes during the semester, you must receive prior permission from Dr. Podgorski or Dr. Ge. *If you are absent from more than 2 classes during the semester without permission, your grade will be lowered by 1 letter grade from what it would have otherwise been.* If you are more than 5 minutes late to class two times, it will be counted as an unexcused absence.

B. Factors Affecting Grade

Your letter grade will be based on: the oral critique (in the semester presented); the written critiques; participation in discussion; and attendance (see §IV.A). Each of the two critiques (oral or written) will constitute 45% of the grade and participation in discussion will constitute the final 10% of the grade (note that it is impossible to get an A without participating in class discussion). If less than two critiques are submitted in one semester, the maximum letter grade will be a C.

1. The score (0-100) for the oral critique will be based on both the audience and course directors' evaluation of the presentation in terms of the content of the presentation and the style of the presentation (see attached form). The course directors' evaluation of the content of the presentation (in terms of the criteria outlined above; see §III.B) will weigh most heavily in determining the score. Consideration will be given to the number of years in the program. The students will receive their scores, audience evaluations, and summaries highlighting the strengths and weaknesses of their presentations within two weeks after presentation.
2. The score (0-100) for the written critiques will be based on evidence for understanding of the subject and insight into the topic as related to the above guidelines (see §III.C). Critiques will be evaluated by one of the course directors and the faculty member who recommended the paper. In order to ensure consistent grading of the written critiques, the course directors will assign a number score taking into consideration the recommending faculty members comments. Students will receive their scores and written comments pertaining to the critique within two weeks (unless the recommending faculty member is not available to review them in that time period).
3. Note that students may elect to turn in more than two critiques -- if so, the final grade will be determined from the best three scores.
4. Maximum of 2 excused absences are allowed per semester. Unexcused absences negatively impact the final grade.

V. LEARNING OUTCOMES

CB7700 Recent Advances in Cancer Biology Course promotes vibrant scientific interactions in an informal atmosphere. It is expected that through participation in this course, Cancer Biology students will: 1) learn to critically evaluate scientific literature; 2) develop both oral and written communication skills; 3) learn to participate in scientific discussion and be comfortable with asking questions during presentations; 4) broaden their knowledge of current state of research in Cancer Biology; and 5) gain insight into the latest tools and experimental approaches that can be used to tackle specific scientific problems. These learning outcomes are critical to the success of the graduate training and to student development into independent scientists, regardless of their exact future career choices.