

BIMM 194 – Gene Regulation in Disease

Fall 2020

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Please use 'BIMM 194' in the subject line

Office hour: Monday or Tuesday rolling, in coordination with the week's discussion leaders – starting Oct 19. Specific times will be posted on Canvas each week.

Goal of the class:

The primary focus of the BIMM194 *Gene Regulation in Disease* class is to learn to read primary research papers and evaluate how experimental observations lead to scientific conclusions. The focus will be on research into gene regulatory - transcriptional and post-transcriptional - mechanisms that when defective lead to human disease.

Weekly schedule:

Each class will focus on one specific research paper. For the first two regular classes (i.e. weeks 2 and 3), the instructor will present the paper to the class. For all other classes (weeks 4 onwards), each student will be randomly assigned to a group of 5-8 students, which will meet as a group during class time to discuss the paper. For each group, one student will be assigned as discussion leader. Each student will serve as discussion leader once during the quarter.

Before each class (starting week 2): All students will submit a pre-class quiz. The quiz is due to the instructor no later than Wed 10AM, 30 minutes before start of class. Please carefully follow instructions below and use the uploaded pre-class quiz template for your quiz.

During each class: The instructor (week 2 and 5) or the assigned discussion leaders (weeks 3-4 and 6-10) will present the paper to the rest of the group following the guidelines described below (see paper discussion guidelines). Other students are highly encouraged to step in and ask questions or help with clarifications at any time during the presentation.

After each class (starting week 3): The discussion leader, with input from the other students in the group, will submit a post-class quiz (see instructions below).

A first version of the post-class quiz is due from the discussion leader no later than the morning of the Monday after the class at 10 AM, at which point it is posted on Canvas to all other students in the group.

Students of the group then have until Tuesday afternoon 4 PM to provide input on the quiz via Canvas discussion, for which students receive extra credit.

The discussion leader then submits a final version on Canvas to the instructor no later than the following Wednesday at 10 AM (i.e. one week after the class).*

*For the Oct 28 post-quiz, the draft is due Mon Nov 2, but discussion is open until Thur Nov 5, 4 PM, and the final post-quiz is due Fri Nov 6, 10 AM, to accommodate the election.

Paper discussion guidelines:

The discussion leader should use a power-point presentation to present the paper using the following guidelines:

- 1) Give a brief, 2-3 slide, BIMM100-level background on the specific area of molecular biology central to the paper (slides from the BIMM100 class are fine). [≈5 mins].
- 2) Present the main conclusion(s) of the paper; you can usually use the title or, even better, a model figure as a slide for this. [≈5 mins].
- 3) Present the evidence for the conclusion(s) by walking through individual figures of the paper. For each figure, discuss the question, experiment, observation, interpretation and controls (as listed under the pre-class quiz). You can skip figures that are not central to the main conclusion(s). Some Supplemental figures can be presented, but only if they are important for the main conclusion(s). For each figure explain how the observations fit into the paper's overall conclusion(s) as discussed under point 2. [≈30-50 mins]
- 4) Discuss as a group what are the 4 most important figure panels that should be discussed in the post-class quiz. Revisit these figures to discuss them in more detail and what should be included in the post-class quiz (see below). [≈15-30 mins].

Pre-class quiz instructions:

Please select one figure panel (e.g. Fig 2B, i.e. only one panel from one figure) that you consider the most critical figure panel for the paper and answer the following questions (note: papers generally have more than one critical figure panel, but choose just one):

- A) What is the scientific question addressed by the experiment?
- B) What experiment was performed?
- C) What was observed from the experiment?
- D) What are the control(s) in the experiment and for each, why are they important?

E) What answer did the experiment provide to the scientific question (i.e. what is the conclusion from the experiment)?

F) Why is this particular conclusion critical to the paper?

Use no more than one page, font size 12, 1-inch margins, single space lines.

You are welcome, and indeed encouraged, to discuss these quizzes with other students before the quizzes are due, but you need to write them in your own words and not use the words of any other person or any sentences from the paper, or have anyone else edit your wording (see academic integrity below).

Post-class quiz instructions:

Same as pre-class quiz, but describe the four most important figure panels. Use no more than one page per figure, font size 12, 1-inch margins, single space lines.

Each student will be the primary writer for one post-quiz in total during the quarter, but will serve as secondary writer all other weeks (see breakdown on impact on grades below). All students should therefore contribute to the discussion of the post-quiz figures during class time and comment on their discussion leader's post-quiz write-up each week.

As for the pre-quiz, the post-quiz needs to be written in the group's own words and not use the words of any other person or group, or any sentences from the paper. The primary post-quiz writer is welcome to use any wording provided by other students within the group, including wording from submitted pre-quizzes. You can think of this as the greatest hits of the pre-quizzes from your group. Do not use wording from any other groups' pre- or post-quizzes.

Members of each group other than the primary writer will receive extra credit up to 2 points (in addition to the up to 10 points for the post-quiz) for comments on the post-quiz provided during the discussion period (Mon 10 AM to Tue 4 PM). Comments like "read the quiz and it looks good" will receive 1 pt, but only make this comment if you actually read the quiz (remember that the instructor can see whether you opened the document in Canvas). More substantial suggestions will receive more than 1 pt.

Scoring of pre- and post-class quizzes:

Pre- and post-class quizzes are scored on a 0-10 scale based on how important the chosen figure panel(s) is/are to the paper, and your complete and accurate answer to questions A-F listed above. Handing in late quizzes and/or not meeting format requirements (i.e. page limit, font size, margins) will cause a reduction in the score or a score of 0 depending on the severity.

Grading:

- 60% Pre-class quizzes. Your 6 highest scored pre-class quizzes (6 of 8).
- 20% Primary post-class quiz.
The post-class quiz for which you are the primary writer (1 of 1).
- 10% Secondary post-class quizzes.
The four highest-scored post-class quizzes (including any extra credit) for which you are a secondary writer (4 of 5).
- 10% Class attendance
Your presence at paper discussions each week.

Letter grades are assigned as follows:

A: 90-100%

B: 80-90%

C: 70-80%

D: 60-70%

F: Below 60%

+/- grades are given to those close to the next grade level

A note on grading: Your own grade is not influenced in any way by how your classmates perform. Working together with your classmates will only help everyone involved. Studying in groups is highly recommended!

Academic integrity:

All suspicions of academic misconduct will be reported to the Academic Integrity Office according to university policy.

For this class, the primary behaviors to avoid is to: 1) never use any wording other than your own for quizzes (or your own group in case of the post-quiz), 2) never attempt to get credit for attendance if you did not actually attend class, and 3) never try to get extra credit for comments on post-quizzes if you have not actually read the submitted post-quiz draft. As listed above, discussing quizzes with peers prior to submission is perfectly fine and indeed encouraged as it helps the learning, the key goal of the class.

Those students found to have committed academic misconduct will face administrative sanctions imposed by their college Dean of Student Affairs and academic sanctions imposed by me. The standard administrative sanctions include: the creation

of a disciplinary record (which will be checked by graduate and professional schools); disciplinary probation; and attendance at an Academic Integrity Seminar (at a cost). Students can also face suspension and dismissal from the University; those sanctions are not at my discretion. Academic sanctions can range from a score of zero on a quiz to an F in the class. The appropriate sanctions are determined by the egregiousness of the Policy violation. Students who assist in or are complicit with cheating could also be in violation of the Policy. Thus, students who become aware of their peers either facilitating academic misconduct or committing it should report their suspicions to me for investigation.

Please review UCSD's Policy on Academic Integrity, which can be found on this website: <https://students.ucsd.edu/academics/academic-integrity/>

It should be needless to say that it is much easier to pass this course by putting the effort into understanding the material of the course rather than into an attempt to pass the course by cheating.

Disabilities:

If you qualify for accommodations because of a disability, please submit to the instructor an AFA letter from the Office for Students with Disabilities (OSD) as soon as possible, and no later than the second week of class, so that your needs may be addressed. The OSD determines accommodations based on documented disabilities. Please see guidelines at: <http://disabilities.ucsd.edu/>