General course information for BIMM 194/BGGN 283:
Bacterial Virulence Factors and Pathogenesis in the Mammalian Host

Class meeting information: Tuesdays at 9:00 AM - 10:20 AM, YORK 3010.
If we switch to virtual learning, we will meet via zoom at: https://ucsd.zoom.us/j/94212500952

Instructor: Fabian Rivera-Chávez, Ph.D.

Contact: fcrivera@health.ucsd.edu
*Please include "BIMM 194 / BGGN 283" in the subject line of your email.

Office Hours: Mondays, 3-4 PM, via zoom: https://ucsd.zoom.us/j/94212500952

Course Website: https://canvas.ucsd.edu/courses/54311

Course Description: This course provides an overview of the field of bacterial pathogenesis. The goal of the course is to learn about the molecular mechanisms of bacterial virulence factors and microbial interactions within mammalian hosts. Students will focus on reading, critically evaluating, and presenting primary research literature.

Prerequisites: Molecular Biology (BIMM 100); upper division standing

Health and Safety: It is important for all of us to work together to protect our health and the health of those around us. Please follow the UCSD health and safety guidelines for COVID-19.

Course Format: Class will alternate between a topic lecture followed by a presentation and discussion of a primary literature paper led by student groups.

Course Credit:

-Short response to lecture topic question on Canvas **(5 points each; 25 points total)**
Each lecture week (i.e. every other week), students will submit a response (~one-paragraph) to an open-ended question related to the concepts covered in that week's lecture. Question will be available the day of the lecture and will be due by the end of the day the following week (for example, the topic question for the Secretory Diarrhea Lecture on April 2 will be due by the end of the day on April 9).

-Group presentation **(45 points)**
The class will be divided into five groups, and each group will be assigned to present a primary literature paper and to lead a discussion of that paper for that class. Primary Literature Paper Presentation Points awarded for succinctly and clearly summarizing the overall significance of the project and motivation (**12 points**); presenting the figures, the experimental goals, and approach (**6 points**), results (**6 points**), interpretation of the results (**6 points**), and conclusion (**6 points**); and your opinion on whether the data in the paper support the authors' conclusions (**9 points**). The same number of points will be awarded to all members of the group. Presentations should be the result of collaboration between group members. Following the presentation, your group will receive anonymous feedback from your class peers (see "Peer feedback" section below).

-Peer feedback on two group presentations (**10 points each; 20 points total**)
You will provide constructive written feedback on presentations given by two other groups. Prof. Rivera-Chávez will assign the classes that you will cover. Feedback will be provided based on a template (see "Peer Feedback Template" below), and the feedback will be due one week following the presentation (e.g., if you are assigned to provide feedback on the presentation given on April 7; your feedback is due

by April 16). The feedback that you provide will then be shared anonymously with the presenters. Points awarded for feedback that is clear, descriptive, and includes the reasoning in support of your comments.

-Participation in class discussion (**10 points**)
You will receive 10 points by participating in the class in the form of asking questions, making comments, and answering open-ended questions during lectures and paper discussions.

Grading: Your grade will reflect a combination of your engagement with and participation in the class (**75 points**) and your performance on written responses (**25 points**). There is no final exam. Points will be awarded as described below. A total of **100 points** is achievable.

25 points.....Short written responses to lecture topic questions on Canvas
45 points.....Group presentation in class (one presentation)
20 points.....Peer feedback on group presentations by other groups (two)
10 points.....Participation in class discussion (comments and questions)

Letter grades will be assigned as follows based on the points achieved:

87-100: A (A-, A, or A+)
77-86: B (B-, B, or B+)
67-76: C (C-, C, or C+)
57-66: D
Below 57: F

Academic Integrity: Academic dishonesty will not be tolerated in this course, with accordance to UCSD policy. Any issues with academic dishonesty will be reported to the UCSD Academic Integrity Coordinator and the Dean of the student's college. Confirmed cases of academic dishonesty will result in the student receiving an F as their final grade and other disciplinary actions determined appropriate by the Academic Integrity Coordinator.

Group Presentation Guidelines
All members of the group will contribute to the presentation and discussion. All members should participate in both the presentation and discussion.

Prepare a ~50 min presentation, which will allow ~15 min for questions/discussion (total time: ~65 min).

The presentation should cover:

-The relevant background information including previous findings and the overall significance of the study and motivation: What is the problem or what is the unanswered question?
Why is this important? Provide enough background so the class can understand the rationale behind the study. This may require reading additional papers. What has already been done, and what do the authors hope to accomplish? What impact will the work have?

-The experimental approach: What experimental techniques are used in this study to address the research question(s) raised?

-The results/data and interpretation: Each figure (including any relevant supplementary figures) should be discussed and interpretation discussed. Are the conclusions of each figure justified? If anything is missing or if data could be improved this should be discussed.

-Conclusions: Discuss whether you think the data in the paper support the authors' conclusions. What experiments if any are missing could improve the study? What do you think would be the future direction(s) for this study?

Peer Feedback Guidelines

Providing Feedback

Keep in mind that your goal is to provide helpful feedback for the presenters. Your comments should be specific and descriptive (not evaluative). However, it can be useful for a presenter to know your opinion, too. Your comments reflect your perspective, so use "I" phrases, for example "I thought..." when providing your opinion. Think about the basis for your comments and provide reasons for your comments. It may be helpful to use "because" to describe your perspective. You are welcome to provide concrete suggestions for improvement.

Do: "I really liked your cartoon model of X because it clearly summarized the authors' key findings. But I didn't understand how the authors concluded Y based on Z data. The data presented on the slide were difficult to understand because there were many panels, and I didn't know which panel had the critical results. Perhaps next time don't show all the panels at the same time, and go slower through the key data."

Try not to do: "Your cartoon of X was good. (*This comment is evaluative with no other information; minimize the use of comments that are only evaluative.) But it was hard to understand the data you presented. Your slides were sloppy and crowded." (*Use specific examples, e.g., describe what was hard to understand, what was sloppy or too crowded. Also, keep in mind that *you* found it hard to understand; rephrase this sentence as "I found it hard to understand...")

Your comments will be shared with the presenters anonymously (without your name). A comment on anonymous feedback: When I review manuscripts anonymously, I ask myself whether I would feel reasonably comfortable providing my name; this serves as a self-check for whether my comments are reasonable and constructive.

Receiving Feedback

Keep in mind that feedback is meant to be constructive and to help in creating effective presentations. This is hopefully an opportunity to evaluate your approach to assembling and giving a presentation. Ways to improve often emerge from similar comments provided by different reviewers. Not all comments, however, may be useful. Consider the suggestions that come up multiple times and identify the suggestions that you feel are useful.

Prof. Rivera-Chávez will be glad to go over the feedback during office hours if there are any comments that you would like to discuss.

Peer Feedback Template

Please fill out this form electronically and return to Prof. Rivera-Chávez within one week of the presentation that you are evaluating.

<u>Effectiveness of Presentation in Communicating Key Information</u>
Your answers to the questions below will enable the presenters to determine whether they communicated their key points successfully.

Based on the presentation:

1. What would you say is the importance of this work?

2. What would you say is the authors' main takeaway, and was the authors' main conclusion(s) were supported by their data?

Clarity of Presentation in Communicating Key Information

Your answers to the questions below will enable the presenters to determine whether it was easy to follow the presentation, understand the key points, and engage with the material.

For the questions below, consider what worked well, and what didn't. Provide reasoning in support of your comments. You may be tempted to start your response with a yes or no answer, but consider how you could start your comments differently, without using yes or no.

3. Was the information organized in a way that made the story easy to follow?

4. Was it easy to understand the information on the slides?

5. Did the presentation clarify anything that had been confusing when you first read the paper? Did the presentation spark a new idea or question?

BIMM 194/BGGN 283 Lectures and Readings Schedule
Bacterial Virulence Factors and Pathogenesis in the Mammalian Host

April 2 – Secretory Diarrhea Lecture

April 9 – Secretory Diarrhea paper
Cholera toxin promotes pathogen acquisition of host-derived nutrients
PMID: 31367037

April 16 – Inflammatory Diarrhea Lecture

April 23 – Inflammatory Diarrhea paper
Gut inflammation provides a respiratory electron acceptor for Salmonella
PMID: 20864996

April 30 – Bacteremia Lecture

May 7– Bacteremia paper
Simian immunodeficiency virus–induced mucosal interleukin-17 deficiency promotes Salmonella dissemination from the gut
PMID: 18376406

May 14 – Enteric Fever Lecture

May 21 – Enteric Fever paper
The Vi-capsule prevents Toll-like receptor 4 recognition of Salmonella
PMID: 18034866

May 28 – Lower Respiratory Infections Lecture

June 4 – Lower Respiratory Infections paper
Extracellular M. tuberculosis DNA Targets Bacteria for Autophagy by Activating the Host DNA-Sensing Pathway
PMID: 22901810