

BIMM 124: Medical Microbiology, Fall 2015

Dr. Cindy Gustafson-Brown

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Class meets at:

Peterson 110

MWF 12:00-12:50 pm

Website: <http://ted.ucsd.edu>

Office hours: Wednesdays 1:10-2:00 PM in HSS 1145L.

Instructional Assistants office hours

Name	Day	Time	Location	email
Simson Hon	Wed	11:00-11:50 AM	Middle of Muir (MOM)	sihon@ucsd.edu
Andrew Chen	Tues	4:00-5:00 PM	Roger's Café (Revelle college)	agc003@ucsd.edu
Lianne Cohen	Thurs	3:00-3:50 PM	Bonner Hall room 4206	l3cohen@ucsd.edu
Sean Lund	Fri	9:30-10:20 AM	Biomed Research Facility 2 - lobby	slund@ucsd.edu

Sections

Section	Days	Time	Location	IA
A01	Mon	6-6:50 PM	CENTR 217B	Simson Hon
A02	Mon	1-1:50 PM	YORK 3000A	Andrew Chen
A03	Mon	4-4:50 PM	CENTR 203	Simson Hon
A04	Mon	5-5:50 PM	CENTR 203	Lianne Cohen
A05	Tues	1-1:50 PM	YORK 3000A	Lianne Cohen
A06	Tues	2-2:50 PM	YORK 3000A	Sean Lund
A07	Tues	5-5:50 PM	YORK 3000A	Sean Lund
A08	Tues	6-6:50 PM	YORK 3000A	Andrew Chen

Introduction

The near doubling in lifespan in the past 1-2 centuries has been due mostly to our control of infectious diseases. They are threatening again to remerge. **The main themes and ideas we will emphasize in Med Micro are:**

1. How infectious agents can be beneficial or cause disease, and how our immune system responds. The response can lead to tolerance or to full-fledged biological warfare with countermeasures, counter-counter measures...
2. How the scientific method is used to study host-microbe interactions and how this knowledge can be used to prevent and treat disease. Mastering the scientific method will help you outside microbiology too!

Outcomes – At the end of this class YOU will become more skillful at:

1. knowing how microbes protect us
2. knowing how microbes cause disease
3. knowing how the immune system protects us
4. knowing how the immune system causes disease
5. knowing how microbial disease is diagnosed and treated
6. taking charge of your own learning
7. being confident in tackling new questions and challenges
8. reading and understanding primary literature; understanding the scientific method; knowing how the scientist thinks, problem solves, and performs research to benefit our lives. These skills will help you learn new things to enrich your life, empowering you to solve challenges in your professional and personal lives.
9. researching and communicating to others about science, disease, and health. YOU can be a resource of knowledge for your family and friends in matters of life and death.

This is an active learning class that requires active participation and critical thinking skills and de-emphasizes memorization. *All exams and assignments are open book and notes.* It will require you change the way you think about science and learning. A lot of the knowledge we learn in class will be obsolete in a few years—critical thinking never will be. Memorization is a skill that got you this far. It will not get you much further. Waiting to the last minute to study for an exam may have worked before. It works poorly here, because the critical thinking skills that you need to succeed have to be developed over time; they cannot be crammed. Today is a new day!

Required materials

Textbook: *Schaechter's Mechanism of Microbial Disease, 5th Edition*. Note: the final exam is open book but closed computer, so **possession of a hard copy of the book is needed**. Copies have been placed on reserved in the Biomedical Library. We encourage you to delve deeper as your time, curiosity, and necessity permits. UCSD has many other textbooks on-line that you can access; there are links on the class web site. If you find something confusing in *Schaechter's*, you can turn to another resource, such as *Sherris Medical Microbiology, 5th Edition*, available free online via the UCSD library (use a VPN on your personal computer for access).

You will need to print out all assigned papers and bring them with you to class, and to your exams.

Clickers (basic iClicker is fine). **Required for this class.** Register your clicker under “tools” on the TED BIMM 124 website. **DO NOT REGISTER ON THE ICLICKER WEB SITE.** We cannot look up rubbed-out clicker numbers for you. If you cannot read the clicker number on your clicker, you can either retrieve it from iclicker website (if you’ve registered it there before) or buy another one.

How we will achieve the aims of this class:

1. **Readings (textbooks and primary literature):** Mandatory reading *before* each class.

Textbook: Your textbook provides foundational information for class, *e.g.* information about the immune system, disease symptoms, mechanisms of pathogenesis and protection. Textbook readings lay the foundation for our classroom interactions. Prior reading of the textbook material **before** lecture **is required** in this class and will serve as the starting point for our discussions. Unlike many other classes you have taken, we will not focus on explaining what was in the textbook readings. Rather they will serve as a starting point for fascinating joint discussions in class, delving into much more interesting and applied topics. Remember, the exams are open book. You do not have to read to memorize, you only need to read to comprehend and get a good background for class. Although you do not have to memorize, you still have to know what is in the readings in order to access the information for exams... “Read before to soar.” This is an opportunity to take charge of your own success. *We recommend that you do all your readings in groups.*

Primary literature: The second of two lectures for each pathogen will focus on primary literature relevant to that pathogen (*e.g.* how it causes disease, interactions with the immune system). Virtually everything we know about immunology and microbial pathogenesis is based on published research. This takes you right to the “fountain of scientific knowledge.” Further, by delving into primary literature, your critical thinking skills will grow like on steroids. This is one of the most important skills we can teach you—a skill you can apply long after UCSD in professions such as medicine, research, pharmacy, industry, law, journalism, politics, economics... It will enrich your life in many ways.

Each week, you will have 1-2 papers to prepare and discuss in class and sections. As with textbook readings, these must be done **before** lecture. This preparation is essential for the paper to make sense and for you to learn how to read, think about, and work with research literature. Knowing how to do this affects a significant part of your grade, since you will use these tools for your “Final Paper” and on the exams. We want to give you ample opportunity to practice to succeed. “Read before to soar.” This is an opportunity to take charge of your own success. *We urge you to do all your readings in groups.*

WHY DO WE REQUIRE READINGS BEFOREHAND? AND WHY WILL WE NOT SIMPLY BE LECTURING FROM THE READINGS AS IN MANY OTHER CLASSES? We assume you are here to learn. Learning requires effort. If the lecture simply rehashes the readings, we will be spoon-feeding you the learning, robbing you of the valuable opportunity to improve your learning and critical thinking skills. Did you know that focusing on higher level learning

skills results in brain development? Research shows this! This course is a weight-lifting class for your brain. We can't do the exercising for you. If you do it, your thinking muscles will grow and so will your success in life. Our goal is your success.

2. **Quizzes.** Each class will begin with a 3-question multiple choice clicker quiz. The goal of this quiz is to give you added incentive to do the reading ahead of time. The class quiz will be strictly on basic understanding of the readings. Our expectation is that >80% of the class will get the answers right provided they have done the readings. The slides with these questions will be framed by an **orange** box. See below for grading.
3. **Interactive lectures with clickers.** These form the “meat” of each class. We will pick a few topics from the readings and write multiple-choice questions that require deeper thinking/cognitive analyses. Many of these you may not get right the first time around. You will get to click in and vote on an answer. Then, you will work in assigned groups to discuss the question for a few minutes, followed by a second opportunity to click in with each group selecting one best answer. From here, we will have in-class discussions as to what the right answer is and what's behind it. The goal of these sessions is actively engage and empower you in YOUR learning process. Our goal is to help you develop your mind and thinking capabilities so that you can succeed in a rewarding life. Our goal is your success. The slides with these questions will be framed by a **green** box. See grading below.

Note on clickers: Our primary impetus for using clickers is not to force attendance. Rather, our goal is to promote participation in class, reading ahead of time, and your success and learning.

4. **Sections.** Sections are mandatory and play a significant role in reinforcing and strengthening your analytical skills. Sections are where your Section Papers are discussed and graded. You must be present to receive a grade on your Section Papers, which can help your course grade. Section papers are excellent practice for classroom discussions, for your exams, and for your Final Paper ... another opportunity to take charge of your success. Sections that do not cover Section Papers are focused on answering questions from the readings and lecture that require further clarification.

How you will be evaluated

1. **Clickers, 10% of your grade:**
 - a. **Orange box quiz questions** = 5% of your grade. Get 75% of these questions correct to get full credit for the quarter. Get 50% of these questions correct to get half credit for the quarter. These are the only possibilities.
 - b. **Green box questions** = 5% of your grade. It does not matter whether you get these right or wrong. Participating in 75% of these questions during 75% of the lectures gives you full credit for the quarter. No partial credit.
2. **Section Papers, optionally 10% of your grade:** There are three optional write-ups on primary literature due in Section. These will be written up according to instructions given with each paper and are to be no longer than 1 page in length. You can work on reading and discussing these assignments in groups and then write up your own answers individually. You are to bring your write-ups to section, where they will be discussed and graded. You must be present in section to get credit for your Section Paper.

For each Section Paper, you may receive:

- “S” (satisfactory) 1 full point
- “I” (improvement needed) ½ point
- “N” (no credit) 0 points

The questions for these papers will mirror those on the exams and Final Paper and are *good, low-stress practice for both*.

If your Section Paper total is:

- ≥ 2 points, then 10% of your final grade is an A (100%)
- < 2 but ≥ 1 point, then 5% of your final grade is an A (100%)

If you earn less than 2 points, the remainder (up to all) of the 10% of credit will transfer to your final exam score.

3. **Exams.** There are two exams in this class:

- **midterm** on Thursday, Oct 29, 7:30-8:50 PM (outside regular lecture time!)
- **final exam** on Thursday, Dec 10, 11:30 AM – 2:30 PM

Both exams are cumulative, *open book, and open notes*. No electronic media (cell phones, computers, calculators, etc...) are allowed. Exams emphasize problem-solving skills and being able to think about and extrapolate information from readings.

The **midterm** is worth **15%** of your grade, but that 15% will be replaced with your final exam score if you do better on the final (most students do). The midterm is a low pressure opportunity to practice for the final.

The **final exam** is worth **40-50%** of your grade **depending on whether you get credit for section papers**. Both exams will be graded on a standard scale (not on a curve) so that everyone has the opportunity to achieve a high grade. The scale is established as follows: 100% on final exam will be normalized to the average of the top 15 grades in the class. **NOTE:** There is no re-grading of the exams, except for incorrect addition of points.

We realize you may have many finals. Please look at your finals' week schedule now. If the timing of this final conflicts with other finals, then you need to either drop the conflicting class or this class. Writing a fair exam for this class takes a lot of effort. Therefore I can write only one version of the exam. To be fair to everyone, I regret I can only offer the final at the time scheduled except under extraordinary documented circumstances (*e.g.* documented illness that requires hospitalization), and I must be notified of that extraordinary circumstance *prior* to the final.

4. The **Final Paper** is an analysis of a primary research article, due at the START of lecture on **Monday, Nov 30**, and worth **25%** of your grade. The format of this paper and what will be expected from the students will be made explicitly clear when the paper is assigned. *You are to work on this individually*, not in groups, and are expected to do your own thinking and writing. We use Turnitin.com to detect plagiarism, which will be treated as a breach of academic integrity. The Final Paper will be graded according to the prompt that will accompany the assignment (similar to your section paper assignments leading up to this). To get full credit you *must* hand in your assignment on time. If you submit it late, there will be several unavoidable consequences. One is, we may not be able to find time to grade it (which would result in a zero), because we have scheduled readers with limited time to grade these. The second is your peers will justly complain that it is unfair you got more time. The third is your peace of mind will probably suffer since you will be piling on your workload before/during finals week. If, for some reason outside your control, you cannot meet this deadline, please email Dr. Gus before the due date. There are no re-grades of the Final Paper.

Grades

Course grades will be assigned as follows:

A: 85-100%; B: 75-85%; C: 60-75%; D: 45-60%.

Academic Integrity: Academic dishonesty undermines the hard work of all students in the class who are engaged in learning and who take responsibility for their learning. Academic dishonesty is incompatible with science and the search for truth. We do not tolerate it. Out of respect and appreciation for your own efforts, nor should you. We encourage you to talk with any of the BIMM124 staff if you learn of any incidents of academic dishonesty. If we suspect dishonesty, we will meet with you to discuss the concern and will report the incident to the Office of Academic Integrity, who will contact your college dean. Academic dishonesty includes:

- clicking in for another student
- copying another student's paper or from any other source
- cheating on an exam

The following is an excerpt from the UCSD Academic Dishonesty policy: *"Each student is responsible for knowing and abiding by UCSD's policies on Academic Dishonesty and on Student Conduct. Any student violating UCSD's Academic Dishonesty or UCSD's Student Conduct policies will earn an 'F' in the course and will be reported to their college Dean for administrative processing. Committing acts that violate Student Conduct policies that result in course disruption are cause for suspension or dismissal from UCSD."* Use of two or more clickers in the class (*i.e.* clicking in for someone else) will be treated as a violation Student Conduct Policies.

How to succeed in Med Micro:

1. Spend the 8-10 hours/week outside of class expected for a four-unit course.
2. Come prepared, having done the assigned readings prior to the lecture. “Read before to soar.” Students who do the work and come prepared to class do better. Period.
3. Participate in lectures and sections. We have run the statistics. Students that participate in class and in section statistically do better than those that do not.
4. Ask questions whenever something is not clear, before/during/after class, during our office hours (please come!), during IA office hours, and in sections.
5. Click in and do all the assignments, including Section Papers. Whether you get “S” or not, you will learn a lot in the process.
6. Talk with the instructors and/or your IA’s about any challenges you are having with assignments, with understanding the material, with reading primary literature, with problem solving techniques. We know this is not easy. Let us know as soon as you are able how we can help you learn.
7. **Study in groups.** Read the textbook in groups. Read the papers in groups. Reading primary literature by yourself is challenging to say the least. It is better in groups. Be a groupie. You learn more from your peers than from instructors. To help, we set up groups in section.
8. Class etiquette: Come on time. If you come late, please sit in the back so as to not disturb others. Be present. That means cell phones off and focus your computer work on class. Texting, surfing, etc... is disruptive to other students.

Sections	Monday lecture	Wednesday lecture	Friday lecture
			Sept 25 Intro and course logistics
Set up groups; Review	Sept 28 Innate Immunity Chpt 6	Sept 30 Innate Immunity Brinkmann 2004	Oct 2 Adaptive Immunity Chpt 7
Section paper #1	Oct 5 Adaptive Immunity Chpt 7	Oct 7 Microbiota Chpt 2	Oct 9 Host-pathogen interaction: Tolerance Janelle Ayres Ayres & Schneider 2012
Review	Bacteria intro Oct 12 pp 18 to top of 26 (before "Cytoplasmic membrane") and pp 29 ("Capsules, Flagella...") and pp 31	Oct 14 Secretory diarrhea Chpt 16	Oct 16 Secretory diarrhea Allen 2006
Section paper #2	Oct 19 Staphylococcus Chpt 11	Oct 21 Staphylococcus paper TBA	Oct 23 Neisseria Chpt 14
Review; Exam prep	Oct 26 Neisseria paper TBA	Oct 28 Film: Hunting the Nightmare Bacteria (PBS – Frontline)	Oct 30 GI protozoa Chpt 53 Sharon Reed
Review	Nov 2 Mycobacteria Chpt 23	Nov 4 Intestinal helminths Chpt 54	Nov 6 Intestinal helminths paper TBA
Section paper #3	Nov 9 Virus intro Chpt 31	Nov 11 HOLIDAY	Nov 13 HIV Chpt 38
Review	Nov 16 HIV paper TBA	Nov 18 Influenza Chpt 36	Nov 20 Influenza paper TBA
Review; Exam prep	Nov 23 Ebola Feldman 2011	Nov 25 Film: Outbreak (PBS – Frontline)	Nov 27 HOLIDAY
Review; Exam prep	Nov 30 Malaria pp 506-512 Elizabeth Winzeler FINAL PAPER DUE IN CLASS!!!	Dec 2 Prions Chpt 56 Christina Sigurdson	Dec 4 Vaccines Chpt 45