

BIOL 2640C

The Immune System

Summer 2011 Course Syllabus

Tuesdays & Thursdays 3:30-6:45 PM



COURSE LEADER:

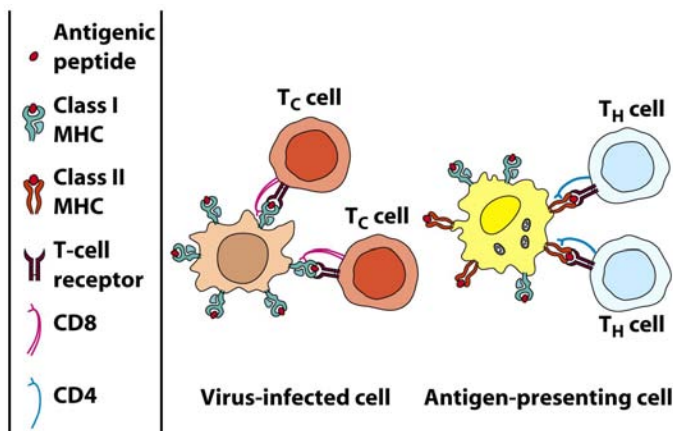
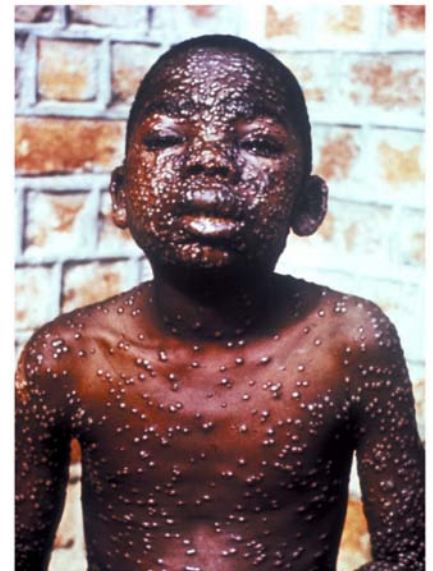
Dr. Richard Bungiro
 Richard_Bungiro@Brown.edu
 Office phone: 401-863-3483
 Cell phone: 401-241-4140

Office Hours:

TBD

OVERVIEW

We share the world with thousands of different microorganisms (viruses, bacteria, and parasites), many of which seek to exploit our bodies for food, shelter and reproduction. Often we are unaware of our microbial “guests”, but in certain cases sickness and even death may occur as a result of their activities. Furthermore, the normally highly regulated process of mammalian cellular development occasionally goes wrong, leading to cancerous tumors that endanger the very organism from which they arose. The immune system is a crucial defender against these external and internal threats and its function (or dysfunction) is literally a life-or-death matter for each of us. Unfortunately, this remarkable defensive system sometimes fails (resulting in immunodeficiency) or goes on the offensive, with complications ranging from the irritating (seasonal allergies) to the potentially lethal (autoimmune disease).



The main objective of BIOL 2640C will be to help you achieve a basic working knowledge of the organization and function of the mammalian immune system. We will first introduce you to the “key players” - the molecules and cells that must communicate and cooperate in order to generate an effective immune response. In the latter part of the course some of the more clinically relevant topics (tumor immunology, autoimmunity, hypersensitivity, organ transplantation, vaccination, HIV/AIDS, etc.) will be presented and discussed.

Immunology is a field in which new information becomes available so quickly that even immunologists (and teachers of immunology) are challenged to keep up. Furthermore, because this is an overview course we'll be covering a lot of information and concepts. Experience tells us that even the best students sometimes feel overwhelmed by the material, and we certainly expect this to happen occasionally during our accelerated summer schedule! Don't worry - we don't expect you to become experts and memorize every single fact. Rather, our most important aim is to help you develop an appreciation of how the various parts fit together to form a functional "big picture". BIOL 2640C is ultimately what you make of it, and a reasonable effort on your part will be rewarded with a good understanding of one of the most fascinating biological systems you will ever study. Our job is to help you with that process.

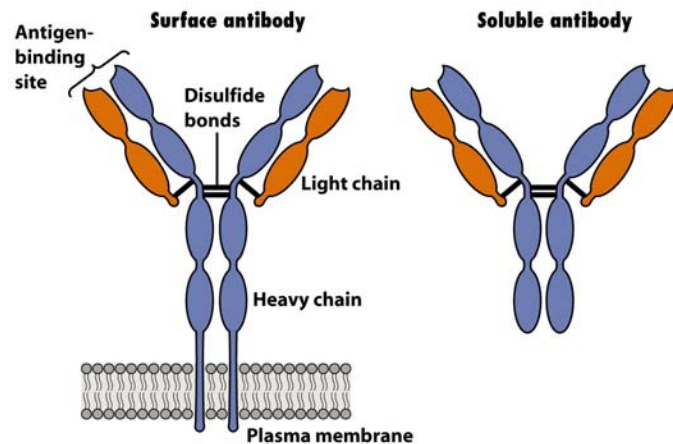
WHO SHOULD TAKE THIS COURSE?

BIOL 2640C is appropriate for post-baccalaureate level students with a basic biology background who want to expand their biological knowledge by gaining an understanding of the mammalian immune system. Furthermore, for students choosing to enroll in the Brown-Pfizer Certificate Program in Infectious Disease and Host Response BIOL 2640C provides a foundation upon which later coursework will be based.

STUDENT RESPONSIBILITIES

As you can probably guess, Dr. Bungiro expects that you will do the reading and come to class - he'll try to make it informative and (occasionally) entertaining. Your input in the form of questions and observations is welcomed, and if Dr. B doesn't know the answer to your question, he'll tell you so - and try to find out the answer for next time.

You are not required to laugh at Dr. B's frequent dumb jokes during lecture, although occasional chuckles are appreciated. Dr. B will do you the courtesy of ending his lectures on time and in return asks that you help him get started promptly by arriving and getting settled in a punctual manner.



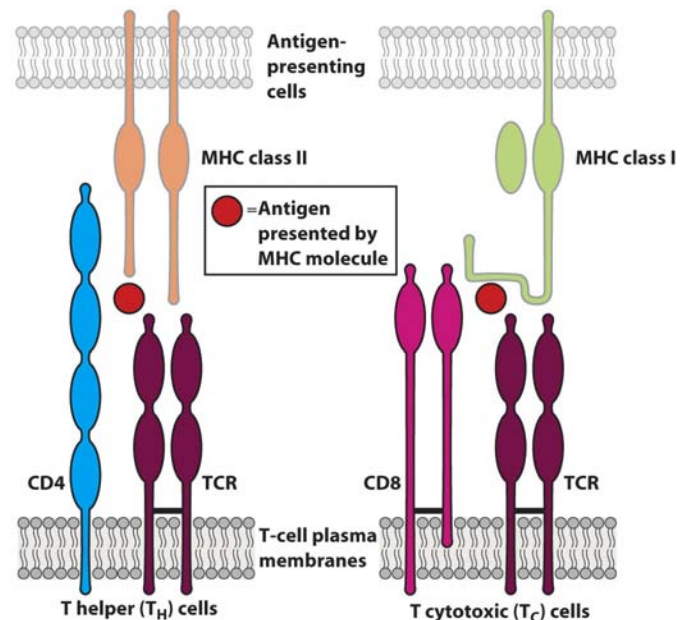
Although not compulsory, we recommend that you review the study questions at the end of each chapter in the textbook which will help you to assess your understanding of the material and assist in preparation for exams. Please feel free to ask Dr. B about these questions as needed. We also suggest that you review Chapter 22 (Experimental Systems), which is the only chapter in the textbook that will not be covered in lecture. Doing so will help to familiarize (or re-familiarize) you with techniques and systems that are frequently employed in the study of immunology (and frequently referenced in the teaching of immunology) such as inbred/transgenic/knockout mice, *in vitro* immune responses, techniques in recombinant DNA, etc. We will not test you specifically on the material in Chapter 22

but since it may be employed in exam or homework questions you should be able to recognize and understand the techniques and systems when referenced. As an example, we won't ask a question like "How do you make a knockout mouse?" but we might begin a question with "A knockout mouse is generated that lacks..."

HOMWORK ASSIGNMENTS

There will be 4 homework assignments involving the immune system of a fictitious organism. The objective of these assignments is to use the immunological knowledge that you will acquire to analyze this hypothetical immune system. This will give you a sampling of how researchers collect, analyze, and interpret data. Because the point is to think, not regurgitate facts, we tend to be as reasonable as possible with the grading (as long as you demonstrate that you *are* thinking!).

When it comes time to turn in your homework we ask that you do so by email (please name your attached file using the format **FirstName_LastName_HW#**). You'll have until 11:00 PM on the days homeworks are due to submit your assignment. Please make sure to use a file format that we can open (".pdf", ".doc" or ".docx" are the safest choices). We'll take care of printing it out and will send you a message confirming that it was received - please make sure to follow up if you don't receive a confirmation. If you choose to submit on paper you must make arrangements to get your assignment to us before the deadline. If you are unable to submit your assignment on time you must contact Dr. B before the deadline to request an extension. Late assignments for which no extension has been granted will be assessed a 10% (2.5 point) penalty if turned in within 24 hours following the deadline, an additional 20% (5 points) for being 24-48 hours late and will not be accepted more than 48 hours after the deadline. Students may collaborate on homework assignments but each student must produce and write their own answers (see section on academic integrity).



EXAMS

There will be one in-class midterm exam and a final exam that will be cumulative but weighted towards the latter half of the course. Like the homework, the midterm and final exams are largely designed to test your analytical skills, and will contain a mixture of short answer questions (e.g. fill-in, T/F, multiple choice) and longer questions typically requiring a few sentences and/or a diagram to answer - on these questions we generally want you to "think a lot, and write a little." The bottom line is that they will often be challenging but not impossible. Thoughtful responses are always considered

and often there isn't just one correct answer on the essay questions - your response just might end up on the answer key! Knowing that the exams are challenging we try to be as equitable as possible with the grading. Sometimes, however, mistakes happen in the grading process. Should you notice an addition error in totaling up your grade, bring it to Dr. B's attention and it'll be fixed right away. If, on the other hand, you have good reason to dispute the way a question was graded you will be able to obtain a regrade - more information on this to follow. Please plan ahead for the exams - excused absences will only be allowed in cases of medical or family emergency and must be approved in writing by the Office of the Dean of the College.

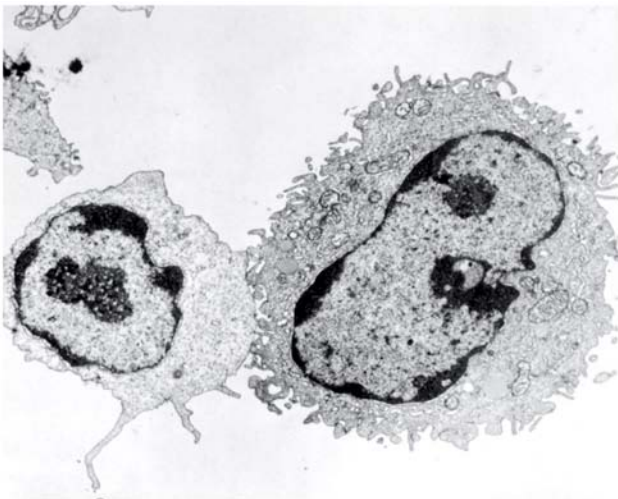
FINAL PAPER

In addition to exams and homework assignments each student will produce a final paper exploring an immunologically-related topic that she/he feels should be the subject of further scientific research or pharmaceutical product development. There will be few restrictions on the choice of topic other than that it be relevant to course material and approved by Dr. B.



A FEW WORDS ABOUT ACADEMIC INTEGRITY

When it comes to homework assignments, working collaboratively (e.g. study groups) is encouraged but all students must produce and write their own answers.



The sharing of written answers, either on paper or electronically, is not permitted. Any form of copying from another's work (such as "cutting and pasting") or allowing your own work to be copied from constitutes cheating and upon discovery will be treated as such. Likewise, when writing exams you must not communicate with others or consult any written or electronic materials. It is course policy to retain copies of all exams and to compare these with anything submitted for a regrade (yes, we really do this). Final papers should include in-line citations where appropriate and a complete bibliography listing all referenced work. As you are no doubt

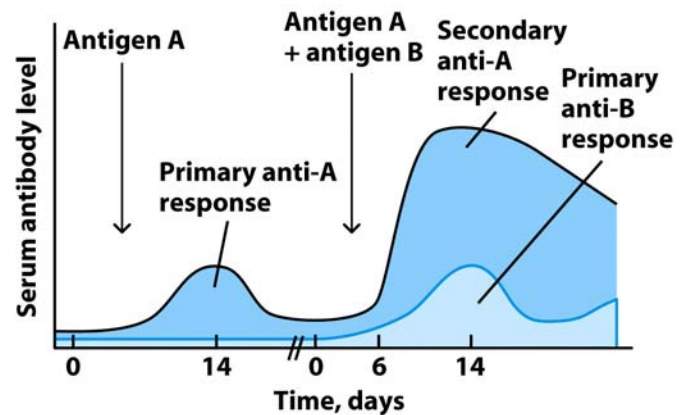
aware, we are bound to deal with violations of any of these policies according to the provisions of the Brown Academic Code. None of us wants to go there so let's keep it honest, OK?

INTERACTION WITH COURSE STAFF

Dr. B will plan to arrive early and remain for at least 30 minutes after each class to answer questions and speak individually with students as needed. He will also answer questions by email and make himself available via electronic media (e.g. Skype), times to be arranged.

GRADING

Final grades will be calculated from the four homework assignments (25 points each, 100 points total), the mid-term exam (100 points), the final exam (200 points), and the final paper (100 points) for a total of **500** available points. If the sum of your scores is at least **425** points (85%) your final grade is likely to be an A. If the sum of your scores is less than 425 points but at least **350** points (70%) your final grade is likely to be a B. Based on overall class performance these point thresholds may be adjusted but will not be increased.

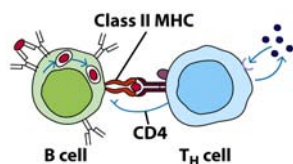


Please note that these are general guidelines and should not be considered a guarantee of any particular grade. Dr. B takes various factors into account when assigning final grades, such as a history of improving scores, performance on the final exam relative to other scores, and class participation. Dr. B also reserves the right to modify the grading policies with notice. Please contact Dr. B if you have any questions or concerns regarding grading.

FURTHER INFORMATION



The textbook is Kuby Immunology 6th ed, by Kindt, Goldsby, & Osborne. The publisher's website for the textbook contains interactive and supplemental resources and can be found at www.whfreeman.com/immunology6e. We recommend that you bring the textbook to class since figures and tables from the book will be used to illustrate the lectures. Copies of lecture slides in PDF format will be posted on the course web page (available at mycourses.brown.edu) prior to each class. You will notice that each class is divided into two lectures - this has been done to accommodate the same amount of material as is covered in the Fall. Dr. B recognizes that three hours is a long time to sit in one place so we will plan to have a short break between the lectures each day.



BIOL 2640C

The Immune System

Summer 2011 Course Syllabus

Tuesdays & Thursdays 3:30-6:45 PM



Note: this is a preliminary schedule which may be subject to modification as needed

Date	Lecture	Topic	Textbook Chapter	Homework
Tue 5/17	(1)	Course Organization / Introduction to the Immune System	[1]	
	(2)	Immune Cells and Organs	[2]	
Thu 5/19	(3)	Innate Immunity / Antigens	[3&4]	
	(4)	Principles & Measurement of Antigen-Antibody Reactions	[6]	
Tue 5/24	(5)	Immunoglobulin Structure / Monoclonal Antibodies	[4]	
	(6)	Organization of Immunoglobulin Genes	[5]	
Thu 5/26	(7)	Expression Immunoglobulin Genes	[5]	HW #1 due
	(8)	B Cell Development	[11]	
Tue 5/31	(9)	B Cell Activation & Differentiation	[11]	
	(10)	B Cell Activation & Differentiation	[11]	
Thu 6/02	(11)	Major Histocompatibility Complex Molecules	[8]	HW #2 due
	(12)	Antigen Processing & Presentation	[8]	
Tue 6/07	(13)	The Complement System	[7]	
	(14)	T Cell Receptors	[9]	
Thu 6/09	(EX)	MIDTERM EXAM (covers Lectures 1-12)		
Tue 6/14	(15)	T Cell Development & Activation	[10]	
	(16)	Cytokines / Helper T Cell Subsets	[12]	
Thu 6/16	(17)	Leukocyte Adhesion & Recirculation	[13]	HW #3 due
	(18)	Effector Responses	[14]	
Tue 6/21	(19)	Tumor Immunology / Transplantation	[21&17]	
	(20)	Hypersensitivity	[15]	
Thu 6/23	(21)	Tolerance & Autoimmunity	[16]	HW #4 due
	(22)	Immune Response to Infections	[18]	
Tue 6/28	(23)	HIV/AIDS and Other Immunodeficiencies	[20]	
	(24)	Vaccines	[19]	

FINAL EXAM: Date & Time TBA

(NOTE: the final exam is cumulative but more emphasis is given to Lectures 13-24)

Textbook: *Kuby Immunology* 6th ed, by Kindt, Goldsby, & Osborne, W.H. Freeman & Company
www.whfreeman.com/immunology6e

Course Director: Dr. Richard Bungiro
 Richard_Bungiro@Brown.edu
 Office hours: TBD
 (other times by appointment)