

# **BIOLOGY 585**

## **CELLULAR AND MOLECULAR IMMUNOLOGY**

### **COURSE SYLLABUS**

San Diego State University  
Spring 2009

Tuesday and Thursday 11:00 AM to 12:15 PM

Room LS 132.

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### **Course Objectives and Learning Outcomes**

This course is designed to serve two types of student populations; advanced upper division undergraduates and graduate students. Students will be introduced to selected contemporary topics of Immunology through lectures, readings of research papers from the primary literature, and presentations by the students themselves. The instructor will introduce the fundamental principles of each topic through lecture presentations. Each set of lectures will be followed by discussion of selected relevant papers from the primary research literature. The papers will be presented and discussed by the students and the instructor will moderate the discussion and critical evaluation of the presented papers. The last few sessions of the course will be devoted to presentations of selected individual topics prepared and delivered by the students. The instructor will assign the topics and provide a general outline for each topic. It will be each student's responsibility to prepare and deliver a short PowerPoint lecture (~10 minutes + 5 minutes discussion) to the class.

The course does not require any previous knowledge of immunology. In fact, students who have taken a full immunology course, at any level, during the past five years are not encouraged to take this course. The prerequisites for this course is a solid understanding of basic concepts of biochemistry and cellular and molecular biology as those studied in Chem 365, Bio 366, and Bio 567 or other equivalent courses. The prerequisites for the course (Chem 365 and Bio 366 or equivalents) will be enforced. Strongly recommended is also Bio 567, which can be taken concurrently. Blackboard will be extensively used and it will be the major means of communication.

The expected learning outcomes of this course is to attain a working knowledge of current immunological principles as they relate to the cells and molecules of the immune system, how they interact in defending the body against invading microorganisms, how they develop and acquire the ability to recognize antigens, and finally how they malfunction in autoimmune diseases and how they become inadequate in immune deficiency states. Furthermore, students will extend and solidify their understanding of the presented principles through critical readings from the primary research literature, as well as student-prepared presentations of individual topics. Reading of research papers will help introduce students to research techniques and also help them appreciate the value of scientific research. Student presentations will contribute towards learning to prepare and present short lectures.

## **Textbook**

“Cellular and Molecular Immunology” sixth edition by Abbas, Lichtman, and Pillai is the recommended textbook. The assigned readings are suggested to help students understand the lecture material. It is strongly advised that students read the assigned chapters before each class lecture. In the periodic in-class quizzes during the semester, students will be responsible for the information in the assigned readings regardless if they've been covered in the class lectures or not. Also, the textbook will be an invaluable source of information for the preparation of the student presentations.

## **Exams**

There will be approximately 7-8 quizzes during the semester (~1 quiz every two weeks). Quizzes will be given on the day of paper discussion before the assigned literature paper is discussed. It will contain questions on the preceding lecture(s) and on the literature paper. Thus, you will be expected to keep up on your reading of the lecture material on a regular basis. Even though you will not be able to use your notes on the lecture material, you will be able to consult the assigned literature paper in order to answer the questions related to it.

All students will be expected to actively participate in the paper presentations and discussion. Students will be asked randomly to come up to the board and discuss particular segments of the paper under discussion. So, every student will be expected to come prepared during paper discussions. The PDF files of the assigned papers will be provided on BB. Evaluation of student presentation and participation will be based on clarity of presentation, understanding the issues addressed and questions raised in the paper, and an effort to provide some critical evaluation of the presented work.

During the last few weeks of the course students will present their own short talks. These will be based on highly focused topics assigned by the instructor. Each student will be assigned a specific topic and a general outline of what should be included. The student will be responsible for developing a short (~10 min + 5 min discussion) talk that will be presented to the class on a pre-assigned date. Evaluation and grading of this assignment will be based on the clarity of presentation, inclusiveness of all points in the outline provided, timeliness of presentation, and command of knowledge judged by answers to the questions the presenter might be asked. Both literature discussion and topic presentations will be evaluated on a scale from 0-5. This will be a semi-quantitative assessment with a score of 5 to indicate that the student exceeded expectations, 4 to indicate excellent presentation, 3 to indicate expected presentation, 2 below average presentation, 1 not acceptable, and 0 no effort. The final scores will be multiplied by a factor to normalize the scores to a percentage scale (see below).

No make-up quizzes or presentations will be allowed. Situations that are beyond an individual's control (critical illness, emergencies etc) will be dealt with at an individual basis. It is the student's responsibility to justify such situations. Having to take more than one exam on the same day does not constitute a justifiable reason. If justified, a missed quiz may be dropped; otherwise it will count as zero points. The short student presentations cannot be made up. They can be only re-scheduled. Otherwise they will receive zero points.

There will be no final exam in the course. The short student presentations will be in lieu of a final exam.

## Grading

The following will be an approximate grade distribution. However, the exact final grade distribution may vary: Quizzes ~50%, paper discussions ~10%, Short presentations ~40%.

Letter grading will be assigned as follows:

A = 92-100%	B+ = 88-89%	C+ = 78-79%	D = 60-69%
A- = 90-91%	B = 82-87%	C = 72-77%	F < 60%
	B- = 80-81%	C- = 70-71%	

<b>Topic</b>	<b>Reading chapters from Abbas</b>	<b>Paper (name of file)</b>
Introduction to the course. Cells and Tissues of the Immune System	1 and 3	1. Surface-bound chemokines..... Friedman et al
Antibody Structure	4	2. Unassembled Ig Heavy Chains ..... Vanhove et al
MHC structure and antigen presentation	5 and 6	3. ERAAP synergizes with MHC class I... Kanaseki et al
Antigen Receptors and accessory molecules	7	4. Full activation of the T cell receptor... Minguet et al
Lymphocyte Development Expression of antigen receptors (BCR/TCR) Regulation of the Immune Response	8	5. Regulation of B versus T lineage..... Maeda et al
Lymphocyte Activation	9 and 10	6. Impaired activation and localization of LAT..... Hundt et al
Cytokines	12	7. Regulated commitment of TNF receptor signaling..... Muiños and Seed
Innate Immunity and effectors of adaptive immunity	2 and 13	8. West Nile virus nonstructural protein.... Chung et al
Effector B cells	14	9. Importance of cellular microenv... Gong
Autoimmunities and Hypersensitivities	18 and 19	10. Analysis of the relationship..... Panoutsakopoulou et al
Immune Deficiencies	20	11. Leukocyte-specific proteint 1..... Smith et al