

Biosc 270 *Immunology* – Spring 2005

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Office hours: MWF 11:00am –2:00pm (room 2809)

Textbook: Immunology 5<sup>th</sup> edition, Goldsby et al.

Lecture Topics and **Exam Dates**

Week of	Topics	Reading
March 28	- Overview of components of the Immune System - Antibody Structure and function - Introduction to the Lab Project	Chapters 1 and 4
April 4	- Hematopoiesis and Organs of the Immune system - Organization and Expression of Ig genes, B-cell receptors	Chapter 2 and 5
April 11	- Guest Lecture: Dr. Martin Allen – Angen - continue Organization and Expression of Ig genes	Chapter 5
April 18	April 19 <b>EXAM I</b> - Generation of T-cell receptor diversity	Chapter 9
April 25	-MHC receptors and Antigen Presentation	Chapters 7 and 8
May 2	-T-cell activation and maturation	Chapter 10
May 9	May 10 <b>EXAM II</b> - B-cell maturation and activation	Chapter 11
May 16	- continue B-cell maturation and activation	Chapter 11
May 23	- Cytokines Student Presentations	Chapter 12
May 31	- Student Presentations - Flow Cytometry, Dr. Sherree	

	Friend	
June 6	June 9 <b>FINAL EXAM</b>	

### *Group Project and Presentations*

#### Immune Disease and Emerging Therapies

Each group will choose immune disease or disorder and search the literature for the current treatment protocols as well as the experimental protocols. It is then the goal of each group to identify a basic research journal article that has provided the rationale for the development of new treatment. Take this hypothetical example. Consider the standard treatment of certain types of leukemia is a bone marrow transplant however a new treatment uses a drug that is a specific protein kinase inhibitor. A group could find the research that identified the gene (a protein kinase) that plays an important role in the development of the disease or the research that demonstrated the inhibitor was specific to the kinase. These results could be summarized and then related to the potential success of the clinical use of the drug. In this way each group will identify how basic research has led to new treatments for immunological disorders. The project has two parts. A written 4-5 page report summarizing your research on the disease and the research article you will present in the class. The oral presentation will be done in class and will 10-12minutes in length. I will give each group feedback on the written report to help improve the organization of the oral presentation.

#### *Group project Due Dates*

*Article choice – April 26*

*Written Report – May 12*

*Oral Presentations – May 24(if necessary), May 26, May 31.*

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Immunology Laboratory Course

The goal of this laboratory is to provide an experience working with Immunochemical techniques. The laboratory will have several sections that will be outlined below. In addition to the new techniques you will be

exposed to this quarter, a major component of the lab will be to allow you to take part in the design of experiments. There will be no assigned laboratory manual. We will use reference books in the lab as well as web resources to find protocols to achieve to goals of the lab. I will designate lab time specifically for you to use the lab resources, work with other groups, as well as myself to design experiments. Finally we will incorporate “Group meetings” every Thursday in which a group will make a 5 minute presentation of results or a new experimental procedure followed by a discussion. Each group will present twice in the quarter.

<i><b>Week</b></i>	<i><b>Topic</b></i>	<i><b>Techniques</b></i>
<b>1</b>	Introduction Experimental planning	
<b>2-4</b>	Antibody purification and labeling	<ul style="list-style-type: none"> <li>- Ammonium Sulfate precipitation and dialysis</li> <li>- Quantification of protein concentration</li> <li>- DEAE fractionation of IgG and IgM</li> <li>- PAGE analysis of fractions (reducing and non-reducing)</li> <li>- Affinity purification of antigen specific antibodies</li> <li>- Biotin Labeling of Ig</li> </ul>
<b>5-7</b>	Use of Labeled antibodies	<ul style="list-style-type: none"> <li>- Dot Blots</li> <li>- Western Blots</li> <li>- ELISA</li> </ul>
<b>8-9</b>	Use of antibodies to isolate proteins and protein complexes	<ul style="list-style-type: none"> <li>- Immunoprecipitation and co-IPs</li> </ul> <p style="text-align: center;">Dr. Bob Finney</p>
<b>10</b>	Flow Cytometry	- Dr. Sherree Friend