

**Immunobiology, BIOL 537
Spring 2012**

Instructor: Dr. Elliott Blumenthal **Office:** Science Building, # 390
Class Meets: 6:00-7:15 PM TR **Phone:** 481-6004 **E-mail:** Blumenth@ipfw.edu
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<u>Date</u>	<u>Topic</u>	<u>Chapter / Page Assignment</u>
January 10	Overview of Immune System	1, pages 3-21
January 12	Innate and Adaptive Immunity & Signal Transduction & Experimental Systems	3 & 22, page 52-75, & 546- 570
January 17	Cells and Organs of the Immune System	2, pages 23-51
January 19	APC, T Cell and B Lymphocyte Interactions	3, pages 57-75
January 24	Antigens and Antibodies and Immune Receptors	4, pages 76-106
January 26	EXAM # 1	
January 31	Structure and Function and Classes of Ig	5, pages 111-144
February 2	Organization of Ig Genes	5, pages 111-144
February 7	Generation of antibody Diversity	5 & 6, pages 105-136 and 145-167
February 9	Antigen-Antibody Interactions	6, pages 145-167
February 14	EXAM # 2	
February 16	Major Histocompatibility Proteins	8, pages 189-222
February 21	Antigen Processing & Presentation to T cells	8, pages 189-222
February 23	T-cell Receptor structure and function	9, pages 223-244
February 28	T cell maturation & Thymus Function	10, pages 245-270
March 1	T cell maturation & Thymus Function	10, pages 245-270
March 6	Spring Break	
March 8	Spring Break	
March 13	B Cell Generation, Activation & Differentiation	11, pages 271-30
March 15	B Cell Generation, Activation & Differentiation	11, pages 271-30
March 20	EXAM # 3	
March 22	Cytokines & Complement	12 & 7, pages 302-325 and 168-187
March 27	Cell-Mediated Effector Responses	14, pages 351-370
March 29	Leukocyte migration and inflammation	13, pages 327-350
April 3	Hypersensitivity Reactions	15, pages 371-400
April 5	Hypersensitivity Reactions & Tolerance	15 & 16, pages 371-388 and 401-424
April 10	Tolerance and Autoimmunity	16, pages 401-424
April 12	EXAM # 4	
April 17	Transplantation & Infectious Disease	17 & 18 pages 425-446 and 447-474
April 19	Vaccines and AIDS	19 & 20, pages 475-492 and 493-524
April 24	AIDS	20, pages 493-524

April 26
May 1
May 1

Cancer and the Immune System
Final Exam Week- No Class
Final- Exam # 5: 5:45-7:45 PM

21, pages 525-545

Assigned Textbook: Kuby Immunology, 6th Edition

Author: Richard Goldsby, Thomas Kindt, Barbara Osborne, and Janis Kuby, W.H. Freeman and Company, New York, 2003

Course Description: Immunobiology is a course geared for the advanced upper level Junior/Senior and Graduate student. The student will be expected to have a background in concepts learned from Microbiology, Cell Biology, and Genetics. When the student completes the course in Immunobiology they will be able to read and understand peer evaluated articles in prestigious journals. The student will be current in their knowledge of immunology and immunological concepts and techniques. The course will cover in depth descriptions of antigen recognition and clearance, interactions between APC's, and T and B lymphocytes, developmental and activation processes involved in immune cell responses, discussion of AIDS, Cancer and Transplantation research, and how the immune system relates to overall health and disease.

Course Grading: There will be 5 exams, based on 500 percentage points. These exams will be made up of multiple choice, true-false, matching and short answer essay questions. The questions will attempt to examine the student's level of understanding rather than ability to memorize the important concepts presented. Thus, the student will have to be able to interpret and synthesize and put together the ideas presented. While each exam will cover the material presented since the previous exam, since an understanding of the new material that is presented is based on a strong foundation of previous material learned, the exams will often cover some of the material from earlier exams.

In addition to the exams, each student (or groups of two students each??) will write and present a relevant and recent research topic in immunology. This research paper will be a **powerpoint** presentation given to the class towards the end of the semester. The assignments will be given within the first three weeks of class. The presentation will be worth 75 points, and will be graded on the following criteria: amount of research done {at least **two** recent articles should be reviewed}, the presentation of the material in a clear manner, the student's understanding of the material, the ability of the student to demonstrate relevance of the material to understanding immunology, a description of up-to-date technology used in the research, and the powerpoint slide program itself.

The course will also employ, at times, a FORUM DISCUSSION and/or WebCT format on the IPFW network. Each student will be expected to, ON AN AS ASSIGNED BASIS, turn in a title and abstract from a journal that is related to a topic in immunology. Each student will be graded on their participation in the Forum discussion on each question presented. Participation is worth 50 points.

Class attendance and class participation (I will call on you when least expected ☺☺☺) will be required of all class members. If an exam has to be made up the student MUST inform the professor PRIOR to the exam and the make up will be composed strictly of essay questions. The exam must be made up within two class meetings of when the exam was scheduled. The professor can be reached either through e-mail or direct voice contact (PHONE for those used to the old fashioned way of communicating!!), or direct eye contact (person-to-person together in the same room). I have found that despite having either someone else's notes or powerpoint notes, that much is missed in overall understanding when students are not in class.

Immunobiology Laboratory, BIOL 565
Spring, 2012
Tentative Schedule
Tuesday & Thursday 4:30-5:45– SB 367/or 302/ 372 –OR- LA 313

- Week 2: January 17th – Introduction to the Laboratory in Immunobiology
Organization of the Labs
Tour of the Facilities: Lab, Lab in SB 302, Labs in LSRC, animal rooms in LSRC
- Week 3: January 24th – Cells and Organs of the Immune System
Demonstration Dissection: please watch video on Lab Web Page
Bone marrow cell isolation
Spleen cell isolation
Thymus cell isolation
Wright's Stain
- Week 4: January 31st– Cell counting (hemocytometer, Coulter Counter)
Spleen and Thymus cell counting
Biorad Assay for Protein determination
Spleen
Liver
Brain
- Week 5: February 7th– Preparation of Spleen Cell Cultures- Proliferation with mitogens
Comparison of radioisotope labeling and the MTT colorimetric assay
Preparation of Brain Homogenate for Western Blot
- Week 6: February 14th – Spleen cell proliferation assay using products from Health Food Store or other products that are advertised to “promote immune response”- **each student is responsible for obtaining a product**
- Week 7: February 21th – Precipitation assays (Ochterlony)
Blood Typing- agglutination
- Week 8: February 28th – Introduction-- Immunoelectrophoresis- Western Blot Assay-- Please watch Video from Lab Web Page on electrophoresis
- Week 9: March 6th – Spring Break**

Week 10: March 13 th –	PAGE and Western Blots for Protein Kinase C (PKC)- comparison of organs from young and old mice: organ/sample preparation
Week 11: March 20 th –	PAGE and Western Blots for Protein Kinase C (PKC)- comparison of organs from young and old mice
Week 12: March 27 st –	ELISA assays for IL-2 and Interferon (IFN)- preparation of supernatants from stimulated spleen
Week 13: April 3 th –	ELISA assay for IL-2 and IFN
Week 14: April 10 th –	Mixed Lymphocyte Reaction (MLR) HLA compatibility- mix spleen cells together from two different strains (Balb/c vs C57/BL6)
Week 15: April 17 th –	Make-up Day
Week 16: April 24 th –	No Lab

There will be no lab book for this course. The student should purchase a **lab note book** and keep a daily/weekly journal of the experiments, the protocol, and observations that are made. Your lab note book will be collected at the end of the semester and graded. You may pick up the lab book at the end of the grading period if you want it back.

The grade that you receive will be determined by lab reports that you write and turn in after each experiment. These reports should completely describe the general protocol used, the experimental design, and the results observed. It should be written so that a person coming to you for advice on how to run an experiment will be able to perform that experiment by referring only to your lab book! WRITE EVERYTHING DOWN IN AN ORGANIZED MANNER 😊😊😊😊