**Immunobiology, BIOL 537**

**Spring 2015**

***Instructor***: Dr. Elliott Blumenthal ***Office***: Science Building, # 390 –OR- LA 313

***Class Meets***: 6:00-7:15 PM TR **Phone**: 481-6004 **E-mail**: Blumenth@ipfw.edu

SB 168 481-6305 (Biology Office)

***Date***

***Topic***

***Chapter / Page Assignment***

January 13

 January 15

Overview of Immune System

Cells and Organs of the Immune System

1, pages 1-24

2, pages 27-61

January 20

Innate and Adaptive Immunity & Experimental Systems

5, pages 141-182 & 20, 653-691

January 22

APC, T Cell and B Lymphocyte Interactions

3, pages 65-103

January 27

Antigens and Antibodies and Immune Receptors

3, pages 65-103

January 29

**EXAM # 1**

February 3

Structure and Function and Classes of Ig

7, pages 225-258

February 5

Organization of Ig Genes

7, pages 225-258

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February 10

Generation of antibody Diversity

February 12

V Major Histocompatibility Proteins

8, pages 261-296

8, 261-

February 17

Major Histocompatibility Proteins 8, pages 261-296

February 19 Antigen Processing & Presentation to T cells

8, pages 285-296

February 24

**EXAM # 2**

February 26

T-cell Receptor structure and function

9, pages 299-327

March 3

T cell maturation & Thymus Function

9, pages 299-327

March 5

T cell maturation & Thymus Function

10, pages 245-270

& 14, 451-482

**March 10**

**Spring Break**

**March 12**

**Spring Break**

March 17

B Cell Generation, Activation & Differentiation

10, pages 329-356

March 19

B Cell Generation, Activation & Differentiation

11, pages 357-383

March 24

B Cell Generation, Activation & Differentiation

12, pages 385-414 & 13, 415-448

March 26

**Exam # 3**

**EXAM # 3e**

March 31

**Cytokines** & Complement

4, pages 105-140

April 2

Cytokines and **Complement**

Cytokines and Complement

6, pages 187-221

April 7

Hypersensitivity Reactions

15, pages 485-516

April 9

Hypersensitivity Reactions & Tolerance

16, pages 517-551

April 14

Autoimmunity and Transplantation

Infectious

16, pages 517- 551

April 16

Infectious Disease and Vaccines

Infectious

17, pages 553-588

April 21

Infectious Disease and Vaccines

In

17, pages 553-588

April 23

Immunodeficiency Disorders

Immun

18, pages 593-624

April 28

Immunodeficiency Disorders

II

18, pages 593-624

April 30

Cancer and the Immune System

19, pages 627-651

May 5

**Final Exam Week**- No Class

**May 8**

**Final Exam # 5**: *5:45-7:45 PM*

**Assigned Textbook**: Kuby Immunology, 7th Edition

Author: Judith A. Owen, Jenni Punt, Sharon A. Stranford and Patricia P. Jones. W.H. Freeman and Company, New York, 2013

**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 APCs, 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 4 exams, based on 400 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 students 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 students 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 Blackboard 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 elses notes or powerpoint notes, that much is missed in overall understanding when students are not in class.

--OTHER DATES TO REMEMBER—

January 19- Last Day for full refund

February 21- Last Day for Audit🡪 Credit change –or-- Credit 🡪 Audit change

March 21- Last Day for Full Withdrawal

***Immunobiology Laboratory, BIOL 565***

***Spring, 2014***

***Tentative Schedule***

***Tuesday & Thursday 4:30-5:45* SB 367/ 372 –OR- LA 313**

Week 2: January 20th Introduction to the Laboratory in Immunobiology

Organization of the Labs

Tour of the Facilities: Lab in LA 313, Labs in LA 314

Week 3: January 27th 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

Wrights Stain

Week 4: February 3th Cell counting (hemocytometer, Coulter Counter)

 Spleen and Thymus cell counting

 Biorad Assay for Protein determination

 Spleen

 Liver

 Brain

Week 5: February 10th 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 17th 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 24th Precipitation assays (Ochterlony)

Blood Typing- agglutination

Week 8: March 3th Introduction-- Immunoelectrophoresis- Western Blot Assay-- Please watch Video from Lab Web Page on electrophoresis

**Week 9: March 11th**  **Spring Break**

Week 10: March 17th PAGE and Western Blots for Protein Kinase C (PKC)- comparison of organs from young and old mice: organ/sample preparation

Week 11: March 24th PAGE and Western Blots for Protein Kinase C (PKC)- comparison of organs from young and old mice

Week 12: April 1nd ELISA assays for IL-2 and Interferon (IFN)- preparation of supernatants from stimulated spleen

Week 13: April 7th ELISA assay for IL-2 and IFN

Week 14: April 14th Mixed Lymphocyte Reaction (MLR) HLA compatibility- mix spleen cells together from two different strains (Balb/c vs C57/BL6)

Week 15: April 21rd Make-up Day

Week 16: April 28th 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