BBMB430 Current Topics in Biochemistry Fall 2009
"Infectious Diseases"

Instructor: Jim Russo

How to reach me: **via Email**: russo@whitman.edu
via Voicemail: 527-5228
via Office: S-352. Office hours T 1-2 pm; W 9-10 am; You are welcome to drop in if my door is open or make an appointment for other times as well. I am also free after class.

How to access materials and each other: CLEo site: BBMB430F09
Email: bbmb_430_a_f09@cleo.whitman.edu

Class meets: In Rm S-142 M,T,TH 9:00-9:50 a.m.

Texts: The *Immune System 3rd Ed,* Peter Parham. Garland Science, 2009
Essentials of Infectious Disease Epidemiology, Manya Magnus. Jones & Bartlett, 2008.

Course goal: My goal is that you gain an appreciation and understanding for the worldwide impact of infectious disease from scientific, medical, social, economic, and cultural perspectives.

Expectations: This is a **400 level seminar course** and your mature approach to the subject matter and continual preparation for each class period is a must. Your contributions to the class will include journal writing, case study presentation and position paper, local public health practicum project, and daily discussion of the day's readings.

Attendance Policy: Class attendance is **required.** (any questions ?) If you must be absent due to illness or emergency, please see me. In order to achieve the above goal, you must come to each class having given a careful read of and reflection on the assigned articles and the previous class discussion. Fruitful class discussion requires your preparation for every class, your willingness to share ideas and experiences, your respect for differing perspectives, **AND** your ability to listen to each other.

Assessment:

Class attendance and participation/discussion	20 %
Journals (includes public health practicum)	30 %
Case study (oral + written)	50 %

Classroom etiquette:
1) Class starts @ 9:00. Late entry to the classroom can be very disruptive.
If you are having difficulty getting out of a previous class on time, please come talk with me.
2) Shoes: yes. Hats: no. Eating and drinking in class: OK if discreet. Cell phones off.
Lack of adherence to classroom etiquette may result in a lowering of your course grade.

Two essential WWW sites: World Health Organization http://www.who.int/en/
Centers for Disease Control www.cdc.gov

Course outline:

I. Epidemiology: Morbidity & Mortality of Infectious Diseases
II. The Immune Response to Viruses, Bacteria, and Parasites
III Prevention: Vaccines (includes practicum)
IV. Treatment: Drugs & Access to Essential Medicines
V. Case-studies

Course research project: Interdisciplinary Learning Consortium

Our course is enrolled in what I think is an interesting study supported by the HHMI. With courses at Carleton, Grinnell, Hope, and St Olaf Colleges, we are exploring what learning gains are unique, if any, in interdisciplinary sciences courses. The research will have 2 components, both of which you have the option to opt in if you wish. First, there is a quantitative survey component, which will invite you to fill out a pre-course (within the first week of class) and post-course (during finals week) survey. The survey will take ~ 10-15 minutes of your time and will be done on-line. The survey is available at: http://www.grinnell.edu/academic/psychology/faculty/dl/risc/

Second, there is a qualitative component which will involve 2 of your journal writing assignments in the course. The evaluation of these writing assignments for the research project will be made by me and other faculty at the colleges in the consortium, and will not take place until next spring/summer, after the course is over. You will receive a consent form in class and can decide to opt in or opt out.

READINGS & CLASS SCHEDULE

I. MORBIDITY AND MORTALITY OF INFECTIOUS DISEASES

T 9/1 Introduction to course
Global Burden of Disease 2004, World Health Organization: Top 10 causes of death Fact Sheet
http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/index.html

Th 9/3 cont. Global Burden of Disease 2004 Ch 1,2.
Journal 1

M 9/7 Public Health in Practice
Magnus, M. Essential Readings in Infectious Disease Epidemiology
Pt 1 Public Health, Passion, Persistence, pp. 4-11.
Pt IV Public Health Progress, Reading 5: Achievements in Public Health, pp. 44-48.

T 9/8 Pandemics & Emerging Infectious Diseases
Lederberg, J. Pandemic as a Natural Evolutionary Phenomenon. pp 21-38. In *In Time of Plague,* Arien Mack, Ed. NYU Press, 1991.

Morse SS. The Public Health Threat of Emerging Viral Disease. *The Journal of Nutrition* 127(5): 951S-957S, May 1997.

Th 9/10 **Journal 2 and Discussion**

II. THE IMMUNE RESPONSE TO VIRUSES, BACTERIA, AND PARASITES

M 9/14 Parham P. The Immune System.
Ch. 1 Elements of the Immune System and their Roles in Defense

T 9/15 Parham, Ch. 2 & 3 Innate vs Adaptive Immunity

Th 9/17 Parham, Ch. 4 Antibody Structure and the Generation of B-Cell diversity
Journal 3

M 9/21 Parham, Ch 5 Antigen Recognition by T Lymphocytes

T 9/22 Parham, Ch. 7 T-cell Mediated Immunity

Th 9/24 Parham, Ch. 8 Immunity Mediated by B Cells and Antibodies (thru 9-12)
Journal 4

M 9/28 Parham, Ch. 10 The Body's Defenses Against Infection

T 9/29 Parham. Ch 11 Failures of the Body's Defenses (thru 11-7)

Th 10/1 **Journal 5 and Discussion**

III. PREVENTION: VACCINES

M 10/5 Parham. Ch 14 Vaccination to Prevent Infectious Disease

T 10/6 Recommendations and Guidelines: 2009 Child & Adolescent Immunization Schedules
http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm

Recommendations and Guidelines: 2009 Adult Immunization Schedules
http://www.cdc.gov/vaccines/recs/schedules/adult-schedule.htm

Th 10/8 Influenza Vaccines: Seasonal & H1N1 - TBD
Journal 6

M,T 10/12-13 FALL BREAK NO CLASS

IV TREATMENT: DRUGS AND ACCESS TO ESSENTIAL MEDICINES

Th 10/15 Anti-microbial and Anti-parasitic agents: structure, mechanisms of action, and resistance

M 10/19 cont.

T 10/20 26 Scheffler RM and Pathania V. Medicines and vaccines for the world's poorest: Is there any prospect for public-private cooperation? *Globalization and Health* 1:10, 2005
http://www.globalizationandhealth.com/content/1/1/10

Th 10/22 **Journal 7 and Discussion**

V. CASE STUDIES

M 10/26	INFLUENZA I	STUDENT TEAM:
T 10/27	INFLUENZA II	
Th 10/29	INFLUENZA III	
M 11/2	INFLUENZA IV	**Journal 8**
T 11/3	MALARIA I	STUDENT TEAM:
Th 11/5	MALARIA II	
M 11/9	MALARIA III	
T 11/10	MALARIA IV	**Journal 9**
Th 11/12	TUBERCULOSIS I	STUDENT TEAM:
M 11/16	TUBERCULOSIS II	
T 11/17	TUBERCULOSIS III	
Th 11/19	TUBERCULOSIS IV	**Journal 10**
M 11/30	HIV I	STUDENT TEAM:
T 12/1	HIV II	
Th 12/3	HIV III	
M 12/7	HIV IV	**Journal 11**
T 12/8	TBD	
Th 12/10	Finale	

FINAL JOURNAL (12) due T 12/15 @ Noon

CASE STUDY INFORMATION

Each Case Study will be divided into two teams of students. Each team will have two class periods for presentation and discussion.

- Team 1 focus: epidemiology of the disease, the biology of the organism responsible for the disease, the route of transmission and infection, and the immune response generated against the organism.
- Team 2 focus: treatment or prevention, prospects for control or eradication of disease, and social/economic impacts of the disease.

You will then submit a position paper (5 pages maximum for text; 1.5 space ; 12 pt font) to me one week completing your case study. I expect to meet with each group several times before your presentations (I suggest an initial meeting together with both teams for each case study 2 weeks before your first day of class presentation; subsequent meetings with each team as necessary)

Essential elements for each case study:

a. What is the name of the disease?

b. What is the causative agent?

c. How is the disease transmitted?

d. How is the disease diagnosed?

e. What is the pathology of the disease?

f. What means of treatment exist? How prevalent is drug resistance?

g. What means of prevention exist? (vaccines, sanitation, bednetting, etc..)

h. Who gets infected? (age distribution; behavioral risk factors)

i. Where does the disease occur? (geographic distribution)

j. What are the origins of the microbe or parasite? (is it a zoonotic disease?)

k. What is the biology of the microbe or parasite: life cycle, genome, etc.

l. What is the mechanism of the infection?

m. What type of immune response is generated? (how does it succeed or fail?)

n. What are the prospects for control or eradication of the disease?

o. What are social/economic impacts of the disease?

Some essentials for quality oral presentations and discussions:

- Practice your presentation to make sure it fits into the designated time frame. Know your material and practice pronunciations (ask before, if uncertain). Your slides should show us as much as possible with graphics, not tell us with words (less text is best).

- Be familiar with the operation of your high-tech presentation devices. Check your presentation at least 1 day in advance to confirm formatting and compatibility with our class computer or your laptop.

- Part of the success of oral communication resides in how you present yourself to your audience. Eye contact, good posture, voice projection, style of dress (hats and shorts, no; shoes, yes)... all contribute to how well your message is received.

- Time spent on selection of readings, preparation of outlines, and submission of discussion questions prior to your presentation days can greatly enhance the quality of your time as Case Study leaders.

- Some of you may not be comfortable speaking in front of your colleagues. If you find standing in front of an audience of your peers challenging, please come talk with me before your talk. Upon request, I would be happy to schedule group-sessions to talk about strategies for effective oral presentations.

BIOGRAPHICAL INFORMATION AND ENTRY QUIZ FOR BBMB 430 Fall 2009

Name: _____ Grad class: 2010 2011

Major(s) _____

Post-Whitman interests/plans: _____
_____

Biology/BBMB courses completed beyond Biol 111/ 205:

Biology/BBMB courses currently enrolled in:

Other courses relevant to global health issues:

Entry quiz:
1. Distinguish between disease incidence & prevalence

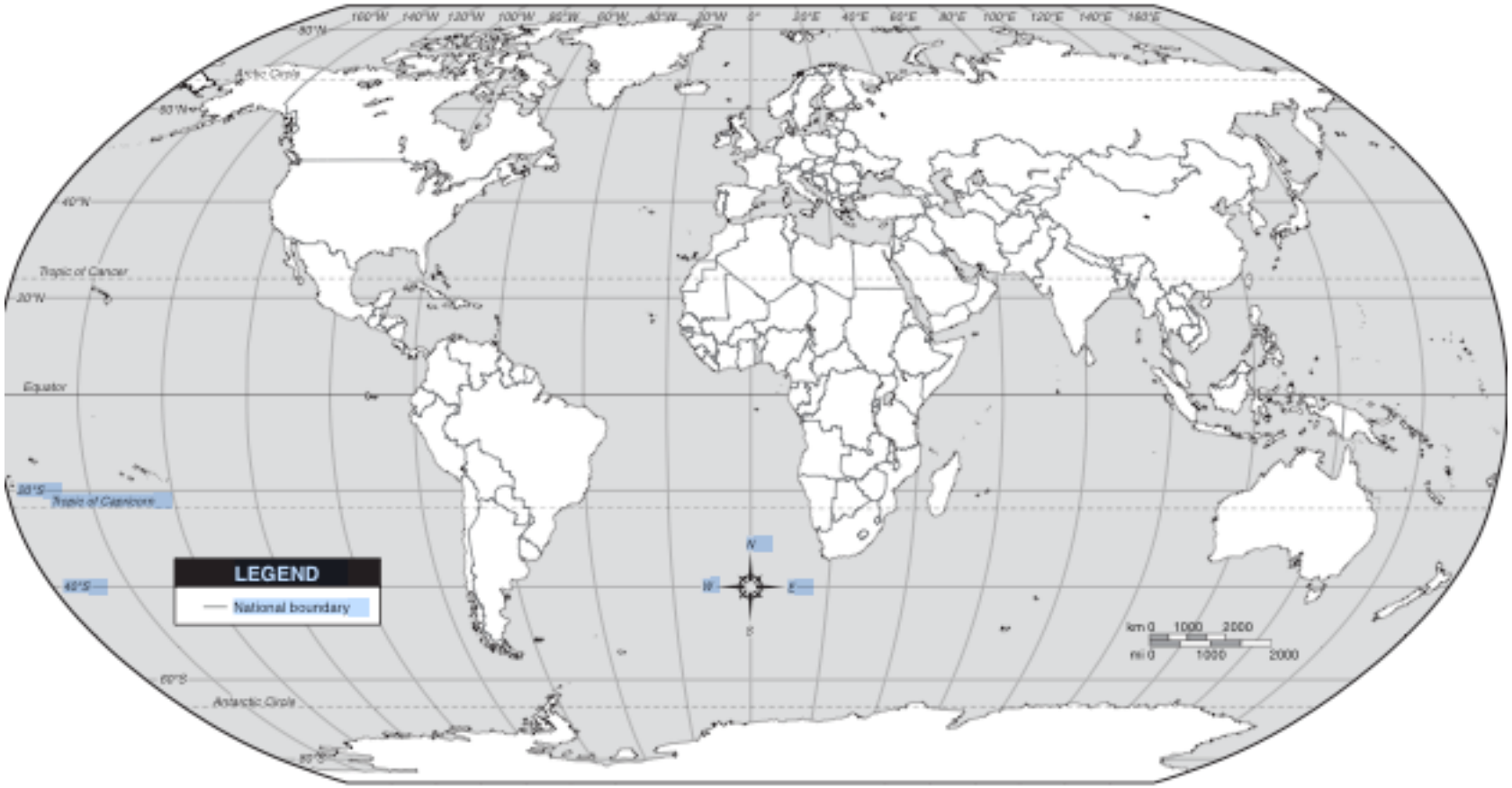
2. For the following diseases, label the causative agent as virus (V), bacterium (B), or protozoan (P)

Cholera	Diphtheria
Giardia	Hepatitis B
HIV	Leishmania
Malaria	Measles
Polio	Tuberculosis

3. What is a vaccine?

4. On the map on the other side, locate the following countries:

Bangladesh	Haiti
Peru	Philippines
Sudan	Malawi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100°E
120°E
140°E
160°E
80°N
Arctic Circle
60°N
40°N
Tropic of Cancer
20°N
Equator
20°S
Tropic of Capricorn
40°S
60°S
Antarctic Circle
80°S
LEGEND
National boundary
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