

Darwinian Medicine: Bio 183WW

I. Instructor:

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Office Hours: 310A Dana Labs, Wednesdays 8:30-10:30 AM (and by appointment)

Course Web Site: <http://blackboard.tufts.edu>

II. The Course:

Human diseases have both proximate (mechanistic) and ultimate (evolutionary) causes. The common medical approach has been to ignore the ultimate causes and, instead, focus on the proximate. Thus, we may understand the physiological processes but not the evolutionary significance. In this course, we will focus on the evolutionary causes of disease.

An additional goal of this course is to teach research skills while sharpening understanding and application of Darwinian thought. To this end, students will generate hypotheses, collect and analyze data to test these hypotheses, and present the information in both oral and manuscript form.

This course will meet twice weekly (Thursdays 8:40-11:40 PM, Barnum 113; and one hour TBA). Our writing workshop meetings are designed to drive home major topics and to accelerate our independent research.

III. Prerequisites

Biology 130: Animal Behavior, or consent of the instructor.

IV. Attendance:

Class attendance is critical to your success in this course. Please arrive on time and prepared. Read over each assignment carefully and note any questions you may have about the material. I encourage class participation and look forward to your questions. If you need to miss a class for a University accepted reason, speak to me about it in advance (if possible).

V. Readings:

Textbook: Neese RM & Williams GC. (1994) *Why we get sick*. Random House, New York.

Additional Readings: Additional readings will be handed out in class. (I will keep these to a minimum.)

VI. Grading:

Midterm Exam (25%)

10-14 Page Research Paper (35%)

 Proposal (20% of paper grade)

 First Draft (30% of paper grade)

 Final Draft (50% of paper grade)

Final Presentation (20%)

Weekly Email Summaries (5%)

Attendance / Participation / Subjective Evaluation (15 %)

VII. Class Format (2 sections):

A. Section 1: Lecture by Starks (~8:40-10:00)

1. Recap previous week (**student led**)
2. Review questions raised by students (see below)
3. New lecture (see lecture schedule)

B. Section 2: Student-led Presentations (~10:45-11:30)

1. Individual presentations (ideas / successes / problems / questions)
2. Group discussion of each presentation

VIII. Email Assignment

A. Due by 5:00 PM on Tuesday *before* Thursday's lecture.

B. General Format

1. Brief synopsis of readings (1-2 short paragraphs ~0.5-1 page, double-spaced, 12-point Times font, and 1" margins on all sides) [You will not always have assigned readings.]
2. Questions relating to readings (if any)
3. Questions relating to previous class (if any)
4. Questions / problems relating to research project (if any)

IX. Research Project (Proposal, 1st Draft, Final Draft, Presentation):

A. Proposal Format (Presented Sept. 25, due by 5:00 PM Sept. 26)

1. 1-3 pages, double-spaced, 12-point Times font, and 1" margins on all sides.
2. Identify disease, symptom, or health problem of interest
3. Identify reference material relating to topic (10-15 sources)
4. List 3-5 possible approaches to studying the topic.
 - *You will present this to the group AND get feedback from us BEFORE the proposal is handed in.*

B. Manuscripts (first draft, Nov. 20; final draft, at final presentation)

1. 10-14 pages, double-spaced, 12-point Times font, and 1" margins on all sides (references do not count toward page limit).
2. See 'how to write a scientific paper' document (will be handed out in a few weeks)
 - *Note: there can be considerable variation on this format.*

C. Final Presentation

1. 20 minutes (15 for the talk, 5 for questions)
2. Follows general paper format (intro, methods, results, and conclusions)
 - *You can use variety of AV tools – discuss with me in advance.*

X. Plagiarism:

You must reference ideas and writings of others properly in the papers you produce for this course. Writing assignments must be your own work. Cheating of any sort will not be tolerated.

XI. Course Homepage:

The course has a web page. To get on the course home page, open an Internet browser and type in the address <http://blackboard.tufts.edu>. The page should allow you to log on using your basic student identifying information.

XII. Lecture Schedule (Tentative) (WW sections to be added)

Week	Topic (after chapters in Neese & Williams 1994)	Readings
<u>Background Information</u>		
1 (Sept. 4)	<p><u>Introduction</u>: Course Overview.</p> <p><u>Background Information (1)</u>: Evolution and Natural Selection; Levels and Units of Selection.</p> <p><u>Background Information (2)</u>: Scientific Method; Levels of Analysis.</p>	
<u>Darwinian Medicine</u>		
2 (Sept. 11)	<p>Why disease?; Framework for Evaluating Disease</p> <p><i>Guest Lecture</i>: Regina Raboin, 233 ERC, Tisch Library.</p>	Chap. 1 & 3
3 (Sept. 18)	Fever as an Adaptive Mechanism	
4 (Sept. 25)	<p>The 'Red Queen', an Evolutionary Arms race</p> <p><i>Project Proposal (email by following Friday)</i></p>	Chap. 4
5 (Oct. 2)	Injury	Chap. 5
6 (Oct. 9)	Poisons and Toxins	Chap. 6
7 (Oct. 16)	<u>Midterm</u>	
8 (Oct. 23)	Genetic Disease; Senescence	Chap. 7 & 8
9 (Oct. 30)	Human Evolution and Evolutionary Legacies	Chap. 9
10 (Nov. 6)	Diseases of Culture	Chap. 10
11 (Nov. 13)	<p>Immunity and Allergy; Cancer</p> <p><i>First Draft of Paper Due</i></p>	Chap. 11 & 12
12 (Nov. 20)	Sex and Reproduction	Chap. 13
13 (Dec. 4)	Mental Diseases; Darwinian Medicine and the Future	Chap. 14 & 15
14 (Dec. 11)	<u>Class Presentations (Final Paper Due)</u>	-