

Seminar in Mechanisms of Aging and Cancer

Bio 374 – Spring 2009

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M/F 2:30-3:45
Hoffberger 137

Course Objectives:

- Study and discuss the biochemical processes that underlie progressive aging in biological systems
- Learn how to effectively read, analyze, and present a primary article from a scientific journal
- Pursue a subject of interest, related to the course, in depth

Course Text:

Clark, William R. (1999) A Means to an End: The Biological Basis of Aging and Death, Oxford University Press (New York). ISBN 0-19-512593-2

Additional readings in the popular scientific literature as well as primary research articles will also be assigned.

Student Presentations:

Each student will give two presentations, one of approximately 30-35 minutes, and the other for an entire class period. These will be “journal club” style presentations in which an article from the primary research literature is presented, much in the same way as if the author of the paper were to present a seminar on his/her own research. In other words, the presenter should be very familiar with, and present clearly to the audience, any background information needed to understand the context of the research, the questions being asked, and the strategies and/or methods being used. The data should be presented in such a way that their validity and significance can be interpreted. Talks will be evaluated on the basis of the above considerations as well as speaking style and effective use of visual aids. Use of Power Point is recommended, supplemented with use of the blackboard as appropriate. **Each presentation should be accompanied by a handout providing information on the citation, authors, and highlights of the background, methods, results and conclusions.** The format for this handout will be provided, and you will have examples and practice in its preparation during the first part of the course.

For the first, shorter presentation, you will choose your topic from a list of provided review or perspective articles, and will focus your talk on a primary research paper referred to in that article. This will free you from the responsibility of doing a literature search to find an appropriate article and put it in the context of the field. For this presentation you should focus on understanding the one primary article and presenting it clearly in the context of the background provided in the article itself, the review or perspective article provided, and any basic information you may have gathered from your own coursework and textbooks. The handout for this presentation will be somewhat modified to include a short summary of the review article and information on one key experiment that will be presented. **You should choose the topic for your first presentation by Monday, February 9th.**

For your final, full-length presentation, you will choose your own topic and paper to present by doing some literature searches investigating areas of interest to you. Keep in mind that the paper must be relevant to topics considered in this course, and must be substantial enough to be conducive to spending ~1 hour presenting it. **You must have your paper approved by me by submitting, by Friday, March 6th, a proposal that includes 1) a copy of the article (hardcopy and electronic, if at all possible), 2) a literature search showing related literature, and 3) a statement of the basic experimental findings in the paper (convince me there's enough there to talk about for an hour), the significance of the article to the field (why did you choose it?), and the areas of background that will need to be presented.**

Since you will not be provided with a review article for your final presentation, you will need to gather background and context information from your own literature search. You may need to read some of the papers referred to in the paper to be presented (for example, previous papers by the same authors that provide groundwork for the experiments in the current paper), and may even find it necessary to present an experiment or two from another paper to clarify your presentation. **To make sure that this gathering of contextual information, and preparation for your talk, are given adequate attention well before the day of your talk, you must submit, no later than one week prior to your final presentation, an outline or Power Point draft of your talk.** It is understood, of course, that things may change as you make the final preparations for your talk.

Audience Responsibilities:

- 1) An active dialog between presenting and non-presenting students is a major goal for any seminar class at Goucher. **All students are expected to come to class having read the paper to be presented and discussed that day.** Every effort will be made to make papers available well in advance (at least one week) of the presentations, in electronic form on Blackboard when possible, or in hardcopy. **To ensure that readings are done before class, there will be a short quiz (5 pts.) at the beginning of class each day during the final phase of the course, relating to the paper that is being presented that day.** Your top eight scores on these quizzes (other than the one on your own presentation day; 40 pts. total possible) will count for 20% of your final grade. Quizzes may not be made up.
- 2) **A portion (10%) of the course grade will be based on class participation,** ranging from zero credit for virtual silence throughout the semester to full credit for regular and substantive contributions to discussions.
- 3) Since you can only participate in discussions if you are present, attendance is mandatory in this course. Lateness is also to be avoided, as it shows a lack of respect for your colleagues and their presentations. You will be allowed one late arrival and one unexcused absence without penalty. **After that, 5 points for each unexcused absence, and 2 points for each lateness >10 minutes, will be deducted from your class participation grade.**

Final Essay:

As your final assignment for the course, please write an essay (3 – 5 pages, double spaced) giving your view of the biological basis for aging. Of the models and theories discussed in class, is there one that has the most support from existing data? Perhaps you feel that there is validity to more than one of the existing theories, or that an entirely new model needs to be developed to accommodate existing knowledge of the aging process. What avenues of research do you feel are most important and/or most likely to be fruitful in furthering our understanding of aging? Please substantiate your statements by referring to at least three papers that were presented this semester (you may include your own presentations). This final essay will be worth 20 pts. (10% of your grade) and will be due in class on the last day.

Course Schedule:**Phase One: Background (Lecture format)****January 30 Introduction: What is aging?**

Assigned reading: Clark, chs. 1-5

February 2 Cell cycle/Cancer

Assigned reading: Clark, chs. 6, 7

Written assignment: Submit choice of topic for short presentation

February 6 Caloric Restriction/Oxidative Stress

Assigned reading: Clark, chs. 8,9

Phase Two: Group Discussion/Analysis of Research Papers**Feb. 9 & 13 Discussion of common experimental techniques**

Written assignment: Each student will be assigned one technique to research and explain (orally, and with a written handout) to the class (10 pts.).

Feb. 16 & 20 Assigned reading: Journal article to be posted on Blackboard

Written assignment: Fill in summary sheet (10 pts.)

Phase Three: Short Journal Club Presentations (2 students per day)

(20 pts. presentation; 10 pts. handout)

February 23 – March 13 (speakers and assigned readings TBA)

Final presentation proposal (10 pts.) due March 6 (3/2 & 3/6 presenters may submit by 3/13);
final presentation outline (5 pts.) due 1 wk prior to final presentation (Mar. 13 for 3/23 and 3/27
presenters, unless emailed over break)

SPRING BREAK March 14 – 22

Phase Four: Full-length Journal Club Presentations (1 student per day)

(40 pts. presentation; 15 pts. handout)

March 23 – May 4 (speakers and assigned readings TBA)

“Assignment”: Don’t forget about the quiz that will be given at the beginning of each class during this part of the course!

Final day of class: Monday, May 4th (wrap-up, course evaluation)

Written assignment: Final essay (20 pts.) (May 1st and May 4th speakers have until Friday, May 8th)

Grading:

Presentations (100 pts. total = 50% of grade):

Short Journal Club	
Presentation	20
Handout	10
Full-length Journal Club	
Proposal	10
Outline	5
Presentation	40
Handout	15

Other assignments (80 pts. total = 40% of grade)

Phase Two homeworks	20
Phase Four	
Quizzes (top 8 scores)	40
Final essay	20

Class Participation (20 pts. = 10% of grade) 20

- 0 = virtually silent
- 20 = frequent and substantive contributions
- 2 for each lateness >10 min. beyond 1
- 5 for each unexcused absence beyond 1

Total 200

Reminder: All students are bound by the standards of the Academic Honor Code, found at <http://www.goucher.edu/documents/General/AcademicHonorCode.pdf>