

PSY D67S PSYCHOBIOLOGY OF AGING AND SELECTED DISEASE STATES

SPRING, 1999 ROOM H309, THURS. 3-5 P.M.

INSTRUCTOR: PROFESSOR GWEN O. IVY

OFFICE: S-569, PHONE: 287-7438

OFFICE HOURS: THURSDAY 5-6, OR BY APPOINTMENT

COURSE DESCRIPTION:

Aging is a complex biological phenomenon which is, at present, a universal and inevitable fact of life. The goal of this course is to characterize the morphological, biochemical and physiological changes in aging neural tissue, as well as to delineate various behavioral and cognitive deficits that occur with age. We will explore the association between cognitive deterioration and age related neuropathologies. Further, we will define the relationship of phenomena which occur during normal aging to those which occur in a number of related disease states, such as Alzheimer's disease, Down's syndrome, Parkinson's disease and Neuronal Ceroid Lipofuscinosis, with the aim of achieving a better understanding of factors which may cause aging at the cellular level. Finally, we will evaluate the validity of several current unifying hypotheses of aging and will describe current and future prospects for research on the underlying mechanisms of aging using animal models.

ORGANIZATION:

The course will meet weekly for two hours and will consist of lectures by the instructor, as well as oral presentations by members of the class. Discussion will follow each presentation. Each person will select a topic from a list compiled by the instructor and will write a 20 page term paper (typed, double spaced, submitted in duplicate) and present a 15 minute talk to the class on that topic with a typed summary to be distributed to the class. Approximate 10 minutes of questions and discussion will follow. The student will be required to place one representative research or review article on his or her topic on reserve in the library (for the class) and to provide one copy of same for the instructor at least one week prior to the oral presentation. There is no textbook.

EVALUATION:

Term Paper (due April 9 in class):	25%
Oral Presentation, includes summary handout and article placed on reserve	15%
Midterm (essay, short answer): 2 hrs. 5-7 p.m. week of <u>Feb 10</u>	20%
Final Exam (essay, short answer): 3 hrs. During Exam Period	20%
Final Exam (essay, take home portion) Due at time of Final Exam	15%
Class Participation: (Includes questions, comments and presence in class)	5%

SCHEDULE OF TOPICS TO BE COVERED

<u>DATE</u>	<u>GENERAL TOPIC</u>	<u>SPECIFIC TOPIC</u>
Jan. 9	Introduction	Course overview/Selection of paper topics
Jan. 14	Morphological and some biochemical and physiological	A. Age pigments (Lipofuscin & other pigments) B. Dolichols C. Dendritic changes D. Synaptic changes E. Amyloid and senile plaques
Jan. 21	changes in neural tissue with age: inheritable diseases with some	F. NFT, PHF
Jan. 28	similarities to aging: Lectures	G. Changes in glial cells H. Cytoskeletal changes

- Feb. 4 by G. Ivy
- I. Cell loss
 - J. Gross brain changes
 - K. Progeria, Werner's syndrome and NCL

Student Oral Presentations:

week of
Feb. 10

Midterm Exam

Feb. 18

READING WEEK !!!! NO CLASS !!!

Feb. 25

Sensory motor and cognitive changes with age

1. Sensory deficits, aging of sense organs - Margaret
2. AD & Down's syndrome. morphological changes in brain - Anchla
3. Cognitive changes in normal aging animals and also (briefly) in Alzheimer's Disease - Titi
4. Vascular System changes - Daphne

Mar.4

Changes in anatomy and in neurotransmitter systems inn aging, AD and PD

5. Pathogenesis of Amyloid Plaques - Alison
6. Blood Brain barrier in aging and AD - Huma
7. Dopaminergic systems in aging and PD - Antoinette
8. Serotonergic and Noradrenergic Systems - Raffy
9. Cholinergic systems in aging and AD - Alexandra

Mar. 12

Theories on mechanisms underlying the aging process

10. Free radical hypothesis of aging - History, overview - Marlene
11. Chemical Reactions and damages - Nada
12. Mitochondria and aging - Sandy
13. Changes in DNA: damage, repair, telomere shortening - Lorman

Mar. 18

Theories (cont'd.)

14. Genetic theories of aging; cell culture - Preetam
15. Metabolic rate and aging - house flies, fruit flies, anti-oxidants - Patti
16. Exercise - athletes - Cynthia
17. Caloric and its mechanisms for prolonging life - Bridgette

Mar. 25 Theories (cont'd.)

18. Drugs and other interventions in the aging process; l-deprenyl , Vitamin E, melatonin Co-enz Q10, centrophenoxine - Helena
19. Changes in protein turnover activities with age - Tasneem
20. Changes in enzymes (activities) with age -
21. Modifications of proteins in aging:
glycosylation, methylation, ubiquitination
22. Animal Models: Nematodes (flat-worms) - Joanne

Apr. 1

23. Prion diseases: CJD, scrapie, Mad Cow
24. Risk factors and safety factors in AD - etiology, familial vs. sporadic - Desa

Apr. 8

26. Protease Inhibitor Model - Ivy
27. Summary, Conclusions - Ivy

Instructions for Oral Presentation and Term Paper

You have selected a topic on the list related to Aging of the nervous system. Your task is to become an expert on this topic. Read Review Articles and do a "Library Search" of the MOST recent literature by using sources such as Medline, Index Medicus and Biological Abstracts. The place to do this is the Medical library at U of T. downtown. Scarborough has few relevant references. The thoroughness with which you examine the literature on your topic will be reflected in the grade for both your oral presentation and your term paper. If you do not yet know how to use the references in the library, the librarian is there to assist you.

When you are satisfied that you have covered the literature relating to your topic, select a Review article (or perhaps 2 separate papers) which in your opinion give the best summary of the current status of research on your topic.

1. Put this article on reserve for the class 1 week before your talk in the Scarborough Campus Library. Label the article with
 - a. Your name
 - b. Your topic
 - c. The date of your talk
 - d. The FULL reference of the article(s) (Aim for 10-25 pg. maximum length)
2. Give me a copy of the same article(s) fully labelled 1 week before talk.
3. Write (Type) a 1-5 page summary of the talk you will present to the class. Hand this out at the time of your talk. This is an outline of your talk to help members of the class follow your points.
4. If you need any audio-visual aids
 - 35 mm slide projector
 - overhead projectorfor your talk, inform me and Audio-Visual Dept. the week before your talk.
5. Your talk should be 15 minutes long. Practice it. It's not easy to present a lot of well organized material in a relatively short amount of time. We will have 10 minutes for questions following each talk. This is the format that is used at scientific meetings when professionals present their data. The goal of your oral presentation is to teach the class about Aging of the Nervous system. Introduce your topic, you may begin with history, with a definition of what your topic encompasses, or with how it relates to aging. Then tell the particulars of your topic. What are the significant findings? Why? Help us to understand why your topic is important and what insight it gives us into aging of the nervous system, and indeed, aging in general. These ideas become your conclusion.

Try to think about the method(s) with which you present your ideas. Speak loudly and clearly, don't "fidget" or mumble. Use slides or illustrations (hand-outs) or black-board drawings as needed.

Term Paper

* You must use full titles in your refs. No numbers in text or refs.

This is a 15-20 page (typed, double spaced) literature review of your topic, written in a professional style as for Physiological Reviews or Progress in Brain Research. The exact page limit is not as important as content and writing style but an excellent paper can be written within 20 pages. Use $\frac{1}{2}$ - $\frac{3}{4}$ inch margins all-around.

* You must give me both the original copy of the paper and a Xeroxed copy, if you want the original returned. I will grade the original, give it back with comments, and keep the Xerox copy.

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Dr. G.O. Ivy

REMINDERS

1. Your term paper is officially due on April, 9th. However, no penalty will be given until after April 12th. At that time, your paper will lose 3 points per day.
 2. In your papers, all references must be complete with authors, titles, journals or books, volumes, pages, etc., so that I may look up the reference if I desire.
 3. References should not be numbered, either in the text or in the Reference List (not called a Bibliography in a scientific paper, in general).
 4. Your paper should be written as a professional review article. Your audience is me, i.e. feel free to be as sophisticated in your presentation as you feel comfortable with. Have someone proofread it. You will lose points for typos, spelling and grammatical errors. At this point in your careers, you will be graded on professional presentation as well as on content.
- * Please hand in 2 copies of your term paper, I will keep one.
5. You will receive up to 3 additional points on your grade for the term paper for handing in your xeroxed references. These must have the source (i.e. journal, vol. pgs., year, etc. -- or book -- etc.) fully demarcated on the paper and must also be complete with the references at the end of it. Otherwise, you will not get as much credit for your copy. Note: This is my way of helping to keep my reference library up to date and, if you've bothered to xerox an article, you may as well receive credit for it. Any marks you make on the article are fine -- no problem.
 6. Please hand in your two take-home exam questions at the time of the exam. If you hand them in late, you lose 2 points per day.
 7. The final exam will be more conceptual than the mid-term, but will also contain some short answer-definition-type questions to make sure you've learned basic facts. Sample questions will be given out soon.