

PSY D67S PSYCHOBIOLOGY OF AGING AND SELECTED DISEASE STATES

SPRING, 1998 ROOM R2512, THURS. 3-5 P.M.

INSTRUCTOR: PROFESSOR GWEN O. IVY

OFFICE: S-569, PHONE: 287-7438

OFFICE HOURS: THURSDAY 5-6, OR BY APPOINTMENT

**UNIVERSITY OF TORONTO
AT SCARBOROUGH**

MAR 18 1998

**OFFICE OF THE CHAIR
LIFE SCIENCES DIVISION**

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 15-20 page term paper (typed, double spaced, submitted in duplicate) and present a 15-20 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. Feb. 26 (in class)	20%
Final Exam (essay, short answer): 3 hrs.	20%
Final Exam (essay, take home portion)	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. 8	Introduction	Course overview/Selection of paper topics
Jan. 15	Morphological and some biochemical and physiological	A. Age pigments (Lipofuscin & other pigments) B. Dolichols C. Amyloid and senile plaques
Jan. 22	changes in neural tissue with age: inheritable diseases with some	D. NFT, PHF E. Dendritic changes F. Synaptic changes
Jan. 29	similarities to aging: Lectures	G. Changes in glial cells H. Cytoskeletal changes
Feb. 5	by G. Ivy	I. Cell loss J. Gross brain changes K. Progeria, Werner's syndrome and NCL

Student Oral Presentations:

- Feb. 12 *Midterm Exam*
- Feb. 19 **READING WEEK !!!! NO CLASS !!!**
- Feb. 26 Sensory motor and cognitive changes with age
1. Sensory deficits, aging of sense organs - Lena
 2. AD & Down's syndrome. morphological changes in brain - Sunny
 3. Cognitive changes in normal aging animals and also (briefly) in Alzheimer's Disease - Gwen
 4. Vascular System changes - *Gwen*
- Mar. 5 Changes in anatomy and in neurotransmitter systems inn aging, AD and PD
5. Pathogenesis of Amyloid Plaques - Nandane
 6. Blood Brain barrier in aging and AD - Bella
 7. Dopaminergic systems in aging and PD - Rick
- Mar. 12 Theories on mechanisms underlying the aging process
8. Free radical hypothesis of aging - History, overview - Robert
 9. Chemical Reactions and damages - Tasmin
 10. Mitochondria and aging - Rohita
 11. Changes in DNA: damage, repair, telomere shortening - Reva
- Mar. 19 Theories (cont'd.)
12. Genetic theories of aging; cell culture - Sumita
 13. Metabolic rate and aging - house flies, fruit flies, anti-oxidants - Samir
 14. Excitatory neurotoxicity (glu, ASP) - Steve
 15. Cholinergic systems in aging and AD - Melissa
- Mar. 26 Theories (cont'd.)
16. Dietary restriction and its mechanisms for prolonging life - Mark
 17. Drugs and other interventions in the aging process; l-deprenyl , Vitamin E, melatonin Co-enz Q10, centrophenoxine - Christina
 18. Changes in protein turnover activities with age - Ken
 19. Changes in enzymes (activities) with age - Ralph

- Apr. 2
- 20. Modifications of proteins in aging: glycosylation, methylation, ubiquitination - Connie
 - 21. Exercise Athletes - Louis
 - 22. Animal Models: Nematodes (flat-worms) - Effie
 - 23. Serotonergic and Noradrenergic Systems - Raffy
- Apr. 9
- 24. Prion diseases: CJD, scrapie, Mad Cow - Dave
 - 25. Changes in Glucocorticoids - Michelle
 - 26. Risk factors and safety factors in AD - etiology, familial vs. sporadic
 - 27. Protease Inhibitor Model - Ivy
 - 28. Summary, Conclusions - Ivy