NROD67 Psychobiology of Aging

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Lecture: Wed 3-5 pm in MW223
Office Hours: Tues 2:00 to 3:00 pm and Wed 11-12 am

Fascinating psychological and biological questions cluster around the phenomenon of development and aging. Indeed, various lines of research are helping us to understand the aging process.

In this seminar course we will explore the neurobiological changes that occur during the process of aging and the relationship between these neurobiological changes and the cognitive changes that are experienced in the aged. We will examine both normal age-related changes and the cognitive changes that occur in age related disease states. Some of the questions we will discuss in this course include the following. Does every species age in the same way as the human? Is there a fundamental process of "aging" common to all organisms? How does the aging process deviate from the "normal" to cause aging-related disorders in long-lived species? Can one prevent and/or modify the aging process? What roles do nature and nurture play in this process? Can we learn something from various human lifestyles, diets, cultures, environments and even from other species in order to enhance healthy aging? Indeed, the quest to maintain a healthy, long life by mankind has been going on from time immemorial. Past and current research has focused on beginning to answer some of these questions. As we progress through this course we will observe that advances in aging research are contributed by worldwide researchers who cut across many disciplines.

Text: There is no text book for this course. Instead you will read various journal articles on topics related to aging.

Grading Scheme:

25% Leading In-Class Assigned Readings
15% Short Response Papers
20% Class Participation
10% Proposal
30% Final Paper

Leading In-Class Assigned Reading Discussions

Each week a group of students will be responsible for presenting the articles to the class and to facilitate discussion of these articles. Each group should work together to come up with a good way to highlight the important issues discussed in the articles and to engage

the rest of the class in a thoughtful and critical discussion of those issues. You will be graded on your ability to summarize/highlight the important issues in the articles, your presentation skills, your understanding of the readings, and your ability to lead and engage your peers in a group discussion. Your grade will be based on the group performance and your individual contributions.

Participation:

You are expected to read assigned papers before each class and attend regularly You will be graded on your active participation in our discussions.

Short Reports:

Students will be required to submit 3 response papers from a possible 6 papers over the term with each paper valued at 5% of your final mark. Response papers should be a maximum of 2 pages, double spaced with no cover page and due no later than the start of the lecture. Late response papers will not be accepted.

The two main purposes of the response papers are to encourage you to 1) read the work in depth in advance of the class and (2) think about it. A good response paper will demonstrate that you have read and thought about the readings in the course. Your response paper should not be a summary of the assigned article, but rather the emphasis of the paper should be on some thought, idea, or criticism you have with respect to the material you read. You should identify some issue, and discuss that issue in light of the readings and/or the current research in the field. For example, you may choose to examine a problem with the assigned reading that could have been better addressed, try and extend the research based on current findings (what would be the next step), comment on how the paper integrates the findings with current developments in theories on the topic, or comment on the interpretation of the data analysis and statistical outcomes. Your goal is to clearly state your issue, and then express your thoughts on this issue. Try to stay focused on one or two issues and cover these in depth, rather than trying to cover too many issues briefly.

Proposal and Literature Review:

Each student will write a review paper on a topic approved by the instructor. Approval for the final paper topic must be completed by Feb 3.A proposal will be required on Feb 24, which should include a detailed outline of the topic you will be focussing on and include a near-complete list of references. Each student will be required to meet with me individually on this date to discuss their progress. Your proposal will contribute 10% to your final grade.

The final paper will be no longer than 12 pages excluding the abstract, cover page, and reference pages. You are encouraged to be as concise as possible in this final paper while adequately covering the topic. APA format is required. Late papers will be accepted but docked 10% per day unless a medical note is provided. Please use only the medical form

available from UTSC online. Final papers are due at the start of class on Mar 31, 2010. You are required to bring a paper copy to class and also submit a copy through Turnitin. Details on Turnitin follow and will be discussed at the first class.

Turnitin:

First, some background information on this program. Turnitin.com is a tool that assists in detecting textual similarities between compared works i.e.: it is an electronic resource that assists in the detection and deterrence of plagiarism.

Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.

As indicated on the turnitin home page, all work submitted to Turnitin is checked against three databases of content:
• A current and archived copy of the publicly accessible Internet (more than 4.5 billion pages updated at a
rate of 30-40 million pages per day);
• Millions of published works (from ABI/Inform, Periodical Abstracts, Business Dateline, ProQuest, the
Gutenberg Collection of literary classics, and tens of thousands of electronic books);
• Millions of student papers submitted to Turnitin since 1996.

Students will submit all written reports to the turnitin.com site (www.turnitin.com). Detailed instructions on setting up your account can be found on this page. You must set up your own account and will need the following information: Course name, NROD67 Class ID #, 3025692; Class Enrolment Password, aging.

http://www.turnitin.com

Tentative Course Schedule

DATE	**TOPIC**	**READINGS**
Jan 6	Course Introduction	
Jan 13	Neurobiology of Healthy Aging	Erickson 2003 Hinman 2007 Imhof 2007 Small 2001
Jan 20	Models of Aging	Roth 2004 Toescu 2005

		Gallagher 1999 Ball 2002 RESPONSE 1
Jan 27	Models continued	Kumar 2009 Bartus 1982 Schliebs 2006
Feb 3	Nutrition and Aging Final Paper Topic must be approved no later than today.	Joseph 2009 Sinclair 2005 Stanner 2004 Piper 2008 Oomens 2009 RESPONSE 2
Feb 10	Class cancelled	
Feb 17	Reading Week- No classes	
Feb 24	Final Paper Outline Due Individual appointments scheduled	
Mar 3	Vascular Cognitive Impairments Behavioral Dementia Perspectives	Jellinger 2005 Ruby 2009 RESPONSE 3 De Belasi 2009
Mar 10	Oxidative Stress/Chronic Stress	Martin 2006 Yao 2007 RESPONSE 4 Gems 2008 Lupien 2005
Mar 17	AD	De la Torre 2004 Swerdlow 2007 Richards 2009 RESPONSE 5 Barberger-Gateau 2007
Mar 24	MCI	Petersen 2001 Albert 2006 Siwak-Tapp 2008 RESPONSE 6
Mar 31	Enrichment Final Paper Due	Siwak-Tapp 2008 Milgram 2005 Edwards 2009

Readings:

Albert MS & Blacker D. (2006). Mild cognitive impairment and dementia. Annu Rev Clin Psychol 2: 379-388.

Barberger-Gateau, et al. (2007). Dietary patterns and risk of dementia: the Three-City cohort study. Neurology 69: 1921-1930.

Ball K (2002). Effects of cognitive training interventions with older adults: A randomized controlled trial. JAMA 288(18) 2271-2281.

Bartus RT et al (1982). The cholinergic hypothesis of geriatric memory dysfunction. Science 217(4558): 408-414.

De Belasi et al. (2009). APOE polymorphism affects episodic memory among non demented elderly subjects. Experimental Gerontology 44: 224-227.

De la Torre JC (2004), Is Alzheimer's disease a neurodegenerative or a vascular disorder? Data, dogma, and dialectics. Lancet Neurol. 3(3): 184-190.

Edwards, JD. (2009). Cognitive enhancement for older adults. Frontiers in Neuroscience 3(1) 108-109.

Erickson CA & Barnes CA (2003). The neurobiology of memory changes in normal aging. Exp Gerontol 38(1-2): 61-69.

Gems K & Partridge L (2008). Stress-response hormesis and aging: "that which does not kill us makes us stronger" Cell Metab 7:200-203.

Gallagher M & Rapp PR. (1997). The use of animal models to study the effects of aging on cognition. Annu Rev Psychology 48: 339-70.

Hinman JD & Abraham Cr (2007). What's behind the decline? The role of white matter in brain aging. Neurochem Res 32(12): 2023-2031.

Imhof A. et al. (2007). Morphological substrates of cognitive decline in nonagenarians and centenarians: a new paradigm? J Neurscience. 257(1-2): 72-79.

Jellinger KA (2005). Understanding the pathology of vascular cognitive impairment. J Neuroscience 229-230: 57-63.

Joseph, J et al. (2009). Nutrition, brain aging, and neurodegeneration. J Neuroscience 29(41): 12795-12801.

Kumar et al. (2009). Susceptibility to calcium dysregulation during brain aging. Frontiers in Aging Neuroscience.

Lupien et al. (2005). Stress hormones and human memory function across the lifespan. Psychoneuroendocrinology 30: 225-242.

Martin I & Grotewiel MS (2006). Oxidative damage and age-related functional declines. Mech Ageing Dev 127(5): 411-423.

Milgram, NW et al. (2005). Learning ability in aged beagle dogs is preserved by behavioral enrichment and dietary fortification: a two year longitudinal study. Neurobiol Aging 26: 77-90

Oomens CA et al. (2009). Resveratrol preserves cerebrovascular density and cognitive functioning in aging mice. Frontiers in aging

Peterson RC et al. (2001). Current concepts in mild cognitive impairment. Arch Neurol. 58(12): 1985-1992.

Piper MD & Bartke (2008). Diet and aging. Cell Metab 8: 99-104.

Richards BA, et al. (2009). Patterns of cortical thinning in Alzheimer's disease and frontotemporal dementia. Neurobiology of Aging 30: 1626-1636.

Roth GS et al. (2004). Aging in rhesus monkeys: relevance to human health interventions. Science 305: 1423-1426.

Ruby P, et al. Perspective taking to assess self-personality: What's modified in Alzheimer's disease? Neurobiology of Aging 30: 1639-1651.

Schliebs R & Arendt T (2006). The significance of the cholinergic system in the brain during aging and in Alzheimer's disease. J Neural Transm. 113(11): 1625-1644.

Sinclair DA (2005). Toward a unified theory of caloric restriction and longevity regulation. Mech Ageing Dev 126:987-1002.

Siwak-Tapp, CT et al. (2008). Region specific neuron loss in the aged canine hippocampus is reduced by enrichment. Neurobiol Aging 20:39-50.

Small SA (2001). Age-related memory decline: current concepts and future directions. Arch Neurol. 58(3): 360-364.

Stanner, SA et al. (2004). A review of the epidemiological evidence for the 'antioxidant hypothesis'. Public Health Nutr 7: 407-450.

Swerdlow RH (2007). Is aging part of Alzheimer's disease, or is Alzheimer's disease part of aging?

Toescu EC. (2005). Normal brain ageing: models and mechanisms. Philos Trans R Soc Lond B Biol Sci 360(1464: 2347-2354.

Yao et al. (2007). Memory and learning impairment induced by dexamethasone in senescent but not young mice Eur J Pharmacol 574(1): 20-28.

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