

All exams will be in-class. Exams will be scheduled outside of normal class to allow for additional time required to take exams. Exam 3 will be given during finals week. Exams will be essay. Oral final exams are for graduate students. Be punctual, as extra time will not be given if you are late. One or more take-home quizzes are possible.

F.2. Review paper required by undergraduate and graduate students

Literature review paper (minimum 5 pages for undergraduates, 10 pages for graduate students; 1.5 line spacing, 1 inch margins, maximum 11 point font size).

Undergraduate students

Since this course focuses on learning to read and understand journal articles as a group, the review paper is an opportunity to apply what has been learned by independently summarizing and critically evaluating one peer-reviewed scientific journal research article investigating some aspect of a neurodegenerative disease. The goal is to summarize and critique all aspects of the article (Introduction, Methods, Results, Discussion) by providing a background and rationale for the study, explaining the approaches used to collect the data as well as the interpreting the meaning of each data figure, and reviewing the significance of all results in the context of the original goal of the article. The paper is due the Monday before finals week.

Graduate students

You will write a mini-review paper which will integrate the work of at least 8 peer-reviewed scientific articles focused on a particular aspect of one neurodegenerative disorder. Identify a topic of interest, search for research articles addressing the topic, then pick a subset of those articles which use complimentary approaches to investigating the topic. Your goal is to gain a deeper understanding of a particular disorder by organizing and critiquing research articles that together have an overlapping theme, identifying where consensus appears to exist, as well as detailing unresolved topics that continue to be debated. From this review, propose future at least on avenue of future research which could address the unresolved issue(s). The mini-review should have an Introduction to the neurodegenerative disease and the specific topic of interest underlying the disease (for example, the role of copper homeostasis in Alzheimer's disease), followed by sections which review different molecular and cellular aspects of the topic (based on the articles chosen), and a section which integrates the different molecular and cellular aspects to provide a broader picture of how multiple components may be interacting to initiate or progress the disease and proposes a new line of research which could address poorly understood processes which may be important. The paper is due the Monday before finals week.

F.3. Oral presentation (graduate students only)

Each graduate student will give a 20 minute Powerpoint presentation that reviews one journal article. The article should be one of those used for the mini-review paper. The presentation should review the article's Introduction, Results (and briefly the methods used to collect the results), and Discussion/Conclusions. The presentations will be given during the last week of classes before finals week.

Letter grades will be assigned as follows: **A:** 90-100%; **B:** 80-89.9%; **C:** 70-79.9%; **D:** 60-69.9%; **F:** <60%.

These are percentages of total possible points accumulated from the in-class exams the review paper, and the oral presentation. Graduate students will be graded on a straight scale, with no curve applied. For undergraduates, in the event that 10% of the class does not score 90% or higher, the A cutoff will be lowered until a minimum of 10% of the class receives an A. However this does come with restrictions, as the A cutoff will not be lowered below 85% of total possible points even if less than 10% of the class score greater than or equal to 85%. Therefore, you should expect that the minimum A will fall somewhere between 85-90%. In the event that the A cutoff is lowered below 90%, the range of all other letter grades will be increased from 9.9 to 10.9%. As an example, if the A's are greater than or equal to 87%, then the B range will be 76-86.9%, the C range 65-75.9%, the D range will be 54-64.9%, and scores less than 54% will receive an F. The greatest possible 'curve' applied to the class would be: A: greater than or equal to 85%, B: 74-84.9%, C: 63-73.9%, D: 52-62.9%, F: less than 52%.

Note that I will be implementing the +/- grading system for this course. The additional grades possible are: A-, B+, B-, and C+ (no C-, D+, D-). The +/- grading will be applied to students within two percentage points below

a letter grade cutoff. Students falling short of a higher letter grade by 0.1-1.0% will receive the higher letter grade, designated with a minus. Students falling short of a higher letter grade by 1.1-2.0% will receive the lower letter grade designated with a plus. For example, if the A cutoff is 87%, then an A- would be 86.0-86.9%, and a B+ would be 85.0-85.9%. The B range is then 76.0-84.9%.

G. Attendance and Policies

1. To comply with the requirements set forth by the US Department of Education, attendance will be taken for the first two classes to verify that those enrolled attend the course. Attendance will be documented and entered manually. It is university policy that students must attend the first meeting of the course, and if a student's attendance has not been verified by the end of the third week of class, the student will be administratively dropped from the class. After the verification period, for the remaining lectures, attendance to the lecture is voluntary.
2. Discussion during the lectures is encouraged.
3. The instructor reserves the right to alter the schedule of topics covered depending on circumstances and interest from those enrolled in the course.
4. The instructor reserves the right to change the exam schedule, the exam format, and the points allocated to each as may be required.

G. Tentative outline of topics

I. Introduction to neurodegeneration

- A. Alzheimer's
- B. Parkinson's
- C. ALS
- D. Huntington's
- E. LHON

II. Basic neuroanatomy of each disease

III Parkinson's disease details

A. MPTP story

- 1. Langston et al 1983 paper
- 2. Langston et al 1984 paper

B. Consequences of MPTP

- 1. Javitch et al 1985 paper
- 2. Ramsay & Singer 1986 paper
- 3. review of mitochondrial function
- 4. Davey et al 1992 paper

*** First exam- mid to late Feb.**

C. Rotenone model

- 1. Betarbet et al 2001 paper
- 2. Greenamyre et al 2001 paper (summary paper)

D. Reactive oxygen species

- 1. definition, types
- 2. sources
- 3. relevance to PD
- 4. Sherer et al 2003 paper- complex I, rotenone, and ROS
- 5. Chinta et al 2007 paper

***Second exam- mid to late March**

E. Familial PD: α -synuclein mutations

- 1. function of wild type α -synuclein: Abeliovich et al 2000 paper
- 2. effects of mutant α -synuclein: Kirik et al 2002 paper or Xu et al 2002 paper
- 3. mitochondria and α -synuclein: Devi et al 2008 paper
- 4. spread of PD via α -synuclein mutation: Desplats et al 2009 paper

***Third exam- during finals week**

IV. Final Exam: Wednesday 9May2018, 8am

A. Test on final papers

V. Review article: must be turned in by Monday 30 April 2018