

Molecular Biology 4K03: Research Advances in the Biology of Aging Fall 2018

INSTRUCTOR: Xu-Dong Zhu, Ph.D.
LSB438
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Office hours: by appointment

LECTURES: BSB B154
Mondays 4:30am – 5:20am
Thursdays 3:30am – 5:20am

COURSE DESCRIPTION:

This course provides a critical analysis of the biology of aging in model organisms and age-related human disorders. The course will focus on not only the molecular pathways that regulate the process of healthy aging but also potential anti-aging interventions.

COURSE OBJECTIVES:

By the end of this course, students will develop and refine their skills in communication, critical thinking and problem solving. Students will be able not only to formulate a scientific hypothesis but also to identify scientific approaches to test the hypothesis. Furthermore, students will develop a comprehensive understanding of the complexity and challenges involved in anti-aging interventions.

PREREQUISITES:

BIO2C03 (MOLBIO2C03) and BIO2B03

REQUIREMENT:

The course material is made up of entirely primary research and review articles.

COURSE EVALUATION:

Final exam	25%
Oral presentation	25%
Project draft outline	10%
Project Report	30%
Peer assessment	5%
Attendance & participation	5%

Written Reports (project draft outline and project report):

All reports must be **written in your own words**. Consult the McMaster Office of Academic Integrity if you are unsure what is considered plagiarism. A mark of ZERO will be assigned to any written report found to contain plagiarism.

NO LATE submission of written reports is accepted and a mark of ZERO will be assigned if the report is not received by the respective due date.

Each student must complete a **one-page** project draft and a **six-page** project report. Each student must hand in a hard copy as well as an electronic copy of all written reports by respective due date.

All written reports **MUST** follow the required format. Failure to observe the required format will lead to **a penalty of up to 10%** of the respective mark.

The required format for all written reports:

- SINGLE spaced
- SINGLE SIDED
- 12 pt, Times New Roman font
- 1 inch margins all around
- Correct scientific language
- Correct grammar and spelling
- NO title page is required but include your name, student number in the header at the top.
- Nature Style of referencing
- NO reference of website is allowed. Cite the original articles.
- Project draft report: one page
- Final project report: eight pages (not including tables, figures and references)

Project Report: Healthy Aging and Aging Intervention

The project report should be written according to the following guidelines:

1. Overview of Healthy Aging and Aging intervention approaches you choose. Include the molecular pathways these approaches may impact on.
2. Rationale for choosing a particular Aging intervention approach or approaches for further analysis.
3. Overview of experimental evidence supporting this approach or these approaches.
4. Overview of experimental evidence questioning the use of this approach or these approaches.
5. Your critical analysis of evidence
6. Your conclusion
7. Possible future work.

Course Topics:

- Overview on Hallmarks of Aging
- Telomeres, Telomerase and Telomere Attrition
- DNA Repair and Genomic Instability
- Histone modification, DNA methylation and Epigenetics Alterations
- Cellular Senescence
- Deregulated Nutrient Sensing and Mitochondria Dysfunction
- Loss of Proteostasis
- Altered Intercellular Communication and Stem Cell Exhaustion

Key Dates:

- Project Draft Outline is due at 4pm on Oct. 5th, 2018
- Project Report is due at 4pm on Nov. 16th, 2018.

REQUEST FOR RELIEF FOR MISSED ACADEMIC TERM WORK:

If you are absent from the university for a minor medical/personal reason, lasting fewer than 3 days, you may report your absence, once per term, without documentation, using the McMaster Absence Form. Absences for a longer duration or for other reasons must be reported to your Faculty/Program Office, with documentation, and relief from term work may not necessarily be granted.

Please note that the MSAF may not be used for term work worth 25% or more. Immediately after using the online tool, students MUST contact Dr. Zhu (zhuxu@mcmaster.ca) regarding the nature of the relief. Failure to do so may negate the opportunity for relief.

CHANGES TO THE COURSE OUTLINE:

The instructor reserves the right to modify elements of the course and will notify students accordingly, both in class and on Avenue to Learn. Posted changes take precedence over this course outline. The University may change the dates and deadlines for any or all course in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the students to check their McMaster email and course websites during the term and to note any changes.

ACADEMIC DISHONESTY:

Students are expected to exhibit honesty and use ethical behavior in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behavior can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (“Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the University. It is the responsibility of the students to understand what constitutes academic dishonesty. For information on various types of academic dishonesty, please refer to the Academic Integrity Policy, located at <http://www.mcmaster.ca/academicintegrity>.

The following illustrates three common forms of academic dishonesty:

- Plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained.
- Improper collaboration in group work. While we encourage students to work with their peers in solving problems on assignments, copying of answers is not acceptable. Your final work must be your own.
- Copying or using unauthorized aids in tests and examinations.

Grades obtained in MB4K03 will be converted according to the following scheme, which is the one in general use at McMaster University.

90-100%	A+	12
85-89%	A	11
80-84%	A-	10
77-79%	B+	9
73-76%	B	8
70-72%	B-	7
67-69%	C+	6
63-66%	C	5
60-62%	C-	4
57-59%	D+	3
53-56%	D	2
50-52%	D-	1
0-49%	F	0