

## CSBL 6048 Biology of Aging

*CSBL 6050 Aging and Longevity Mechanisms (module 1)*

*CSBL 6049 Molecular and Cellular Mechanisms of Aging (module 2)*

**Spring 2018**

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**CLASS DAYS and TIME:** Mondays and Wednesdays 10:00 AM - 11:50 AM, January 22 to May 21, 2018

**CLASSROOM:** ALTC 2.203 **except: \*\*\*Wednesday, February 7<sup>th</sup> is scheduled in 2.211C MED\*\*\***

**COURSE FACULTY:** Course Director: Dr. Pamela Larsen [larsenp@uthscsa.edu](mailto:larsenp@uthscsa.edu), Course Co-Directors: Drs. James Nelson [nelsonj@uthscsa.edu](mailto:nelsonj@uthscsa.edu) and Qitao Ran [ran@uthscsa.edu](mailto:ran@uthscsa.edu)

**OFFICE HOURS:** By email, please schedule a date and time to meet with faculty. We are happy to meet with you and individual scheduling allows us to be efficient with your time and ours (no waiting or missed drop-ins).

**EMAIL:** Dr. Pamela Larsen [larsenp@uthscsa.edu](mailto:larsenp@uthscsa.edu), Drs. James Nelson [nelsonj@uthscsa.edu](mailto:nelsonj@uthscsa.edu) and Qitao Ran [ran@uthscsa.edu](mailto:ran@uthscsa.edu)

**TELEPHONE NUMBERS:** Dr. Pamela Larsen 567-0608, Dr. James Nelson 562-6132, and Dr. Qitao Ran 567-3842

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**READ THIS DOCUMENT CAREFULLY - YOU ARE RESPONSIBLE FOR ITS CONTENTS.**

### COURSE DESCRIPTION AND OBJECTIVES

Biology of Aging is the core course of the Biology of Aging Track. The course consists of two parts: "Aging and Longevity Mechanisms" and "Molecular and Cellular Mechanisms of Aging". The purpose of this course is to provide students with the most up-to-date information on the current understanding of the aging process. This advanced interdisciplinary graduate course provides experimental understanding of the interrelated areas of aging and age-related diseases. Faculty from several departments will cover the molecular and cell biology of aging, model systems used for aging studies, age-related changes in organs and tissues, and age-related diseases.

**Pre-requisites** – None

**Semester credit hours** – 4 credit hours awarded for successful completion of the course

By the end of this course, each student should be able to:

- Describe fundamental aging processes that occur at the molecular, cellular, and physiological levels.
- Critically read and interpret published biology of aging research.
- Demonstrate skill in experimental design and analysis, including pros and cons of use of animal model systems to gain knowledge and issues particular to aging research.
- Develop hypotheses and design experimental approaches to test the emerging hypotheses.

## **COURSE ORGANIZATION**

This course is composed of two parts. Part 1 is Aging and Longevity Mechanisms. Part 2 is Molecular and Cellular Mechanisms of Aging. The course structure for both parts is same. Each half will focus on 4 topics that will provide the student with generalizable concepts about knowledge and research on aging and the age risk component of age-related diseases. Each topic will be the subject of study for four sequential class sessions.

The first two sessions on a topic will be in an interactive lecture format and there may be assigned foundation reading comprised of research publications, reviews or book chapters. These class sessions are labeled Lecture in the schedule. Student discussions and presentations centered on the topic's springboard paper and associated homework will occur at the third and fourth sessions on a topic.

In preparation for the third session, each student will complete homework for an assigned springboard research paper. The homework has two parts. The first is a series of questions to guide critical review of the springboard paper. The second is to identify a significant question arising from the paper and develop a hypothesis and 2 or 3 specific aims to test the hypothesis. This independent study homework and Initial Aims will have a deadline for electronic submission via Canvas.

At the third session, labeled Initial Aims on the schedule, will begin with 30 minutes of critical discussion of the springboard paper. The remaining 70 minutes of class time will be used to discuss hypotheses and aims proposed by students. Using the presentation template provided, each student will present his or her hypothesis and how to experimentally test it. Then the faculty will moderate a student discussion and selection of one specific aim, or some variation thereof. The goals of the round table discussion for each student are to refine their hypothesis, further develop a single aim and to avoid redundancy of proposals presented at the fourth class session.

In preparation for the fourth session, labeled Developed Aim on the schedule, each student will continue to improve his or her hypothesis statement and single aim for presentation during class. The Developed Aim will have a stated deadline for electronic submission via Canvas. At the Developed Aim class session of a topic, students will each present their hypothesis, aim and key experiments. The faculty and students will critically evaluating the students' work concluding with suggestions to improve the hypothesis and aim.

**Materials** – PDFs of research publications, reviews or book chapters.

**Computer Access** – Computer to access university email and Canvas course management webpage.

**Reading Assignments** – To be provided via Canvas and/or email as PDFs of research publications, reviews or book chapters.

## **ATTENDANCE**

Attendance at each class session for the entire class period is required. Deduction of 20 points will occur for any unexcused absence, as determined by the course directors, for initial aims or developed aims class sessions. Partial absence will lead to a deduction of 5-15 points for that class session.

## TEXTBOOKS

**Required: None**

**Recommended: None**

## GRADING POLICIES AND EXAMINATION PROCEDURES

For each topic, three items will be graded: written springboard paper critic, initial aims and developed aim. The templates for the paper critic and the aims presentations will be provided on Canvas. Discussion for the springboard paper and feedback to classmates' presentations will be incorporated into the score for initial aims and developed aim class sessions. The quality of the hypothesis and aim(s) will be scored by faculty. Note, incorporation of feedback provided by others into the developed aim will be necessary to obtain the highest possible score.

On time submission of springboard paper critic, initial aims and developed aim assignments is required. Late submission will result in 5 points deduction for each occurrence. Unexcused absence, as determined by the course directors, for initial aims or developed aims class sessions will result in deduction of 20 points from the score for that class session. Partial unexcused absence will lead to a deduction of 5-15 points for that class session, as determined by the course directors.

### Grading System

For graded items, the student's individual score from a possible 100 points will be displayed on Canvas. For calculation of the final course score, the weighting of the graded items will be: 10% written springboard paper critics, 30% initial aims sessions and 60% developed aim sessions. Equal weight will be given to each of the eight topics. The conversion of the final score to a letter grade will be:

- A for 90 to 100 points
- B for 80 to 89.9 points
- C for 70 to 79.9 points
- D for 60 to 69.9 points
- F for 59.9 or less points

The final letter grade for the course may be based on a curve.

## REQUESTS FOR ACCOMODATIONS FOR DISABILITIES

In accordance with policy 4.2.3, **Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA)**, any student requesting accommodation must submit the appropriate request for accommodation under the American with Disabilities Act (ADA, form 100). to his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at <http://uthscsa.edu/eo/request.asp>.

## **ACADEMIC INTEGRITY AND PROFESSIONALISM**

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at

<http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/academicdishonestypolicy/>

## **TITLE IX AT UTHSCSA**

### **Title IX Defined:**

Title of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads “no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.”

### **University of Texas Health Science Center San Antonio’s Commitment:**

University of Texas Health Science Center San Antonio (UTHSCSA) is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSCSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director.

In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567-2800. Additional information may be obtained at <http://students.uthscsa.edu/titleix/>

## **EMAIL POLICY**

Email to your livemail.uthscsa.edu account will be the official means of communications regarding changes to items such as the schedule, a room number, an error in the materials, etc. Please maintain sufficient space in your mail box to receive any such notices. Course faculty will not attempt other means to provide you with a notice if they receive a course notice because “an exceeded email limit”.

## **USE OF RECORDING DEVICES**

Recording during class sessions is not allowed, unless prior approval is obtained by the instructors or approval is agreed upon in compliance with ADA (see above under accommodations).

## **ELECTRONIC DEVICES**

Use of laptops or tablets is allowed during class for Biology of Aging course content only. Please do not engage in use of social media, play games, surf the web or shop during class. This reduces your learning

during class and may reduce that of other students as well. Furthermore, use of cell phones or smartphones for conversations or texting during lecture or lab is strictly prohibited. You need to silence your phones or turn them off during lecture and lab sessions. Any student in violation of this policy maybe excused from the learning environment and marked absent for the day, if disruption of learning occurs.

**CSBL 6048 Biology of Aging  
Spring 2018 Schedule**

MODULE 1: *Aging and Longevity Mechanisms (CSBL 6050, 2 semester credit hours)*, Jan 22 – March 26, 2018.

Course Director: Dr. James Nelson

(\*Note: Presidents' Day not a university HOLIDAY in 2018)

Date	Day	Activity	Topic	Topic Instructors
Jan 22	Mon	Class Orientation		Drs. Larsen, Nelson, Ran
Jan 24	Wed	Lecture	Human Aging and Frailty	Drs. Alfred Fisher and Sara Espinoza
Jan 29	Mon	Lecture		
Feb 31	Wed	Initial Aims		
Feb 5	Mon	Developed Aim		
Feb 7	Wed	Lecture	Elucidation of Mechanisms of Aging	Drs. Randy Strong, James Nelson and Pamela Larsen
Feb 12	Mon	Lecture		
Feb 14	Wed	Initial Aims		
Feb 19*	Mon	Developed Aim		
Feb 21	Wed	Lecture	Cellular Senescence and Stem Cells in Aging	Drs. Peter Hornsby and Erzsebet Kokovay
Feb 26	Mon	Lecture		
Feb 28	Wed	Initial Aims		
March 5	Mon	Developed Aim		
March 7	Wed	Lecture	Neurobiology of Aging	Drs. Veronica Galvan and Naomi Sayre
March 12	Mon	Spring Break		
March 14	Wed	Spring Break		
March 19	Mon	Lecture		
March 21	Wed	Initial Aims		
March 26	Mon	Developed Aim		

MODULE 2: *Molecular and Cellular Mechanisms of Aging (CSBL 6049, 2 semester credit hours)*, March 28 – May 21, 2018. Course Director: Dr. Qitao Ran

Date	Day	Activity	Topic	Topic Instructors
March 28	Wed	Lecture	Oxidative Stress and Mitochondrial dysfunction and Proteostasis	Drs. Qitao Ran and Karl Rodriguez
April 2	Mon	Lecture		
April 4	Wed	Initial Aims		
April 9	Mon	Developed Aim	Inflammaging	Drs. Ellen Kraig Ann Griffith
April 11	Wed	Lecture		
April 16	Mon	Lecture		
April 18	Wed	Initial Aims	DNA damage and Repair	Drs. Paul Hasty and Alex Bishop
April 23	Mon	Developed Aim		
April 25	Wed	Lecture		
April 30	Mon	Lecture	Nutrient Sensing and Signaling in Aging	Drs. Adam Salmon and David Sharp
May 2	Wed	Initial Aims		
May 7	Mon	Developed Aim		
May 9	Wed	Lecture		
May 14	Mon	Lecture		
May 16	Wed	Initial Aims		
May 21	Mon	Developed Aim		