

## Biochemistry 650 Fall Term, 2016

### Topics covered:

Biology of aging across species; definitions of lifespan, senescence, and allostasis; oxidative stress and repair in senescence; energy transduction and homeostasis; repair of proteins; physiological aspects of aging with respect to the brain, immune, and cardiovascular systems.

Instructor	Email	Office	Phone
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### Class Hours:

- Monday-Wednesday-Friday: 10:00-10:50 am
- Room: **LPSC 302**

### Office Hours:

- By appointment

### Learner Resources:

- None assigned, but suggested texts for background purposes:
  - *Lehninger's Principles of Biochemistry*, 5th Edition. Nelson, D.L., and Cox, M.M.
  - Biochemistry Free and Easy Textbook for iPad and Mac/Win (FREE) - <http://biochem.science.oregonstate.edu>
  - *Molecular Biology of Aging*. Guarente, L.P., Partridge, L., and Wallace, D.C., eds. 2008. Cold Spring Harbor Laboratory Press, NY
  - *Aging at the Molecular Level*. Zglinicki, T-v., ed. 2003. Kluwer Academic Publishers. Boston, MA.

## **Lecture Material:**

*All slides presented in class will be available as files that can be downloaded and printed. Many of these files are unavoidably large and therefore will take some time to download.*

For your benefit, the following useful information will be made available on the class Canvas website:

- Syllabus: a calendar of topics discussed; the syllabus will also include dates when the class will not meet due to holidays and conferences.
- Announcements—especially regarding inclement weather, class cancellations, postponements, etc.
- Links to supplemental lecture material

## **Evaluation:**

- **There will be no mid-term exams or a final exam for this course**
- Grades will be assigned based on:
  - Class participation
  - Paper presentation and preparedness
  - Interactive learning modules

## **Paper Presentations**

- The class will be divided into three teams (team assignments set by the instructor with the goal of creating working groups with divergent academic backgrounds and interests)
- Each team will be assigned a research topic relevant to the course whereby they will have to become conversant in the background material related to that particular topic
- The team will develop a short presentation on their assigned topic and also lead discussion of relevant research paper(s) for the class.
- The instructors will provide support for each team as needed.

## **Missed Classes**

- It is understandable that classes will be missed in order to attend meetings, or from sicknesses and/or personal time conflicts, etc. However, if more than two class periods are missed (unless excused by the instructor), the student will be expected to make up the missed time by reading pertinent papers on the topics missed and also provide a brief presentation on the topic to the class. Presentations will take place during the assigned “final exam” period.

## **Learner Outcomes**

- Understand the fundamental nature of the aging process
- Learn key definitions related to the cell and molecular aspects of aging: longevity, senescence, allosteric homeostasis, oxidative stress, energy partitioning and signal transduction, and hormesis
- Learn how major metabolic pathways become dysregulated with age and how this dysregulation affects senescence and lifespan
- Acquire a working knowledge of the key longevity assurance pathways that have been identified
- Gain an understanding of age-related changes in important organs and physiological systems

## **Learner Expectations**

- It is expected that students will come prepared for lectures by studying the previous lecture material and hand-outs
- As students comprising the class come from diverse academic backgrounds, it is expected that they will integrate information on the biological aspects of aging with their own academic fields and freely share their perspectives with the class as a whole

## **Course Prerequisites and CO-requisites**

While prerequisites have been waived for this course, students will find a foundation in cell and molecular biology to be highly pertinent in understanding the course material. Courses that would greatly aid in being prepared for this course are: BB314, CH440, and BB451 or BB491.

## **University Policies**

Please note: “Students with documented disabilities who may need accommodations, who have any emergency medical information the instructor should know, or who need special arrangements in the event of evacuation, should make an appointment with the instructor as early as possible, no later than the first week of the term. Students seeking accommodations should be registered with the Office of Services for Students with Disabilities.”

Oregon State University rules on civility and honesty can be found at:

(<http://studentlife.oregonstate.edu/studentconduct/offenses-0>)

As several serious cases of academic dishonesty (i.e. cheating) have taken place in the class in the past, multiple security measures will be implemented to discourage such behavior. Before exams, seating may be arranged, or rearranged, at random and according to the proctor’s discretion; you may be asked to move to a different seat from the one you chose before the exam begins. No hats may be worn during exams. The use

of cell phones, PDAs or other electronic devices, other than calculators, are strictly forbidden during exams. Students may be monitored by video surveillance during exams. Additionally, you may not leave the exam room to go to the restroom or any other reason without expressed permission of the proctor. **You will be required to show your valid OSU student identification card when turning in your exam.** There may be different versions of each exam. We are sorry that such procedures must be put into effect, but we also feel these measures are necessary in order to encourage academic honesty.

Cheating or plagiarism by students is subject to the disciplinary process outlined in the Student Conduct Regulations. Students are expected to be honest and ethical in their academic work. "Academic dishonesty" is defined as an intentional act of deception in one of the following areas:

- ◆ Cheating-use or attempted use of unauthorized materials, information or study aids
- ◆ Fabrication-falsification or invention of any information
- ◆ Assisting-helping another commit an act of academic dishonesty
- ◆ Tampering-altering or interfering with evaluation instruments and documents
- ◆ Plagiarism-representing the words or ideas of another person as one's own

Behaviors disruptive to the learning environment will not be tolerated and will be referred to the Office of Student Conduct for disciplinary action.

*"The goal of Oregon State University is to provide students with the knowledge, skill and wisdom they need to contribute to society. Our rules are formulated to guarantee each student's freedom to learn and to protect the fundamental rights of others. People must treat each other with dignity and respect in order for scholarship to thrive. Behaviors that are disruptive to teaching and learning will not be tolerated, and will be referred to the Student Conduct Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office."*