Instructor: Dr. Deborah Kristan
Office Hours: Wednesday 9:00-10:00, and by appointment
Contact information: phone: (760) 750-4638; email: dkristan@csusm.edu

WebCT:
You will access many course materials on the class WebCT cite. You will need your CSUSM username and password (same as your university email) to access WebCT. If you are unfamiliar with using WebCT please refer to the step-by-step instructions provided by IITS at http://courses.csusm.edu/resources/webCtBasics.htm.

Objectives:
During this lab you will test several theories of aging and learn about diseases of aging that affect humans. We will perform experiments from an integrative perspective ranging from cells in culture to whole animal responses of fruit flies and laboratory mice. For all experiments you will be expected to understand the underlying physiological mechanisms that are proposed to regulate or change with each experimental protocol. These concepts must be incorporated into your papers. Our lab exercises will allow you to connect theoretical information you learn in lecture in Bio 512 (e.g. the theory of hormesis) with a hands-on experiment to support or refute the theory (e.g. exposing genetically altered fruit flies to environmental stressors). In this way, the laboratory course will directly link with the lecture course and you will be able to use information obtained in one learning environment to assist you in the other.

Student learning outcomes:
Students who successfully complete this course should 1) be able to design, execute, analyze and present an experiment, 2) understand how theories of aging discussed in Bio 512 lecture can be tested in the laboratory, 3) be aware of how to responsibly and ethically use vertebrate and invertebrate animals in research, and 4) be able to effectively articulate experimental results in oral and written formats.

Graded assignments:
Your grade will be based on four components: (1) papers written in scientific format (2 at 100 points each), (2) poster presentations (1 @ 100 each), (3) One oral presentation (100 points), (4) worksheets (3 at 50 points each), and (4) Preparation and participation in the lab (150 points). Papers are due at the start of class. Late papers will have a grade reduction of 10% per day. Participation in the lab is mandatory and includes hand-in worksheets. Students must demonstrate preparedness for lab by answering questions in pre-lab lectures and during lab sessions. Final grades will be assigned on a point basis; therefore, you are not competing with each other—I encourage you to work together as much as possible, but of course all graded assignments must be entirely your own.
Use of Animals in Research

In accordance with federal law, the California State University San Marcos Institutional Animal Care and Use Committee (IACUC) has responsibility for assuring the humane care and use of laboratory animals at this university. If you have any additional questions or concerns about laboratory animal care and use at California State University San Marcos, please contact the IACUC Chair or the Associate Vice President for Research:

IACUC Chair:                    Associate Vice President for Research
Dr. Richard Bray               Dr. Gerardo M. González
Dept. of Biological Sciences   5215 Craven Hall
760 750 4175; rbray@csusm.edu   760 750 4066; ggonz@csusm.edu

Other Notes:
Email. Occasionally I will want to contact the class using your University assigned e-mail. If this is not an account you check often then please go to the following site to forward the CSUSM account to your home address - http://public.csusm.edu/cwis/tools/forward/

Disabled student services. Students with disabilities who require academic accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (DSS). This office is located in Craven Hall 5205, and can be contacted by phone at (760) 750-4905, or TDD (760) 750-4909. Students authorized by DSS to receive accommodations should meet with me individually to ensure your privacy.

Academic honesty. Academic honesty (e.g. no cheating, plagiarism, etc.) will be strictly enforced. Please refer to pages 77-79 of the 2006-2008 CSUSM Catalog for University policy.
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<tr>
<th>Week</th>
<th>Date</th>
<th>Laboratory Activity</th>
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| 1    | Jan 24     | • Lab Safety; Paper writing.  
• Use of Animals in Research; IACUC test.  
• Experimental design of mouse-caloric restriction experiment.                                                                                           |
| 2    | Jan 31     | • Review of micropipetting basics (*worksheet*).  
• Finish IACUC test.  
• Mouse handling; assignments for weighing mice.                                                                                                         |
| 3    | Feb 7      | • Introduction to sterile methods & general cell culture techniques.  
• How to determine cell dilutions for experiments (*worksheet*).  
• Counting cells (trypan blue staining).                                                                                                                  |
| 4    | Feb 14     | • Start cell lines from laboratory mouse kidneys.  
• Group assignments for cell maintenance.                                                                                                                 |
| 5    | Feb 21     | • Passage cells.  
• Experimental design of cellular response to oxidative challenge.                                                                                   |
| 6/7  | Feb 28     | • Plate cells to test cellular response to oxidative challenge  
• During the week, give cells stressors.                                                                                                                 |
| 7    | Mar 7      | • Cell survival assay  
• How to summarize & present data.  
• Begin Experiment: Age & resistance to oxidative stress (*Drosophila*).                                                                               |
| 8    | Mar 14     | • **Turn in paper: Cellular response to oxidative challenge.**  
• Analyze & interpret first *Drosophila* survival data.  
• Sex differences & genetic selection for resistance to stress.  
• Experimental design for exposure of long-lived *Drosophila* to Paraquat, Starvation, Cold & Heat.  
• Start experiment; make group assignments.                                                                                                             |
| 9    | Mar 21     | • Analyze & interpret second *Drosophila* survival data.                                                                                                                                                         |
| 10   | Mar 28     | **SPRING BREAK: NO LAB.**                                                                                                                                                                                             |
| 11/12| Apr 4/11   | • **Poster presentations:** Diseases of aging (clinical trials).                                                                                                                                                  |
| 13   | Apr 18     | • **Turn in paper: Response to stress by *Drosophila*.**  
• Collect mouse blood. Isolate & freeze plasma.  
• Measure glucose & lipid profiles on whole blood.  
• Review ELISA assay theory & methods.                                                                                                                     |
| 14   | Apr 25     | • Measure plasma leptin & insulin of *ad lib* fed and caloric restricted mice (ELISA assays).                                                                                                                       |
| 15   | May 2      | • Analyze & interpret mouse data (*worksheet*).                                                                                                                                                                     |
| 16   | May 9      | • Student **oral presentations** with question/answer session.  
• **Turn in paper: Effects of caloric restriction on the glucose-insulin pathway in mice.**                                                            |