FDSC 6443

Metabolism of Xenobiotics

Fall 2016

Instructor: Sun-Ok Lee, Ph.D.
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Office hours: By appointment

Location: D2
Time: Tu Th 1:00 pm – 2:15 pm

Description & Goals:

This course is designed to provide in-depth knowledge of the integration of molecular, cellular, and physiologic aspects of xenobiotics (e.g phytochemicals)/micronutrients and metabolism. This course will also discuss the current understanding of the mechanism and regulation of gene expression by which xenobiotics/micronutrients. Examination of current research literature to understand how xenobiotics/micronutrients and physiological states metabolize and influence gene expression, as well as the research methodology used to address these relations.

Prerequisite: CHEM 3813

Learning Outcomes:

- Students will synthesize accurate and comprehensive understanding of xenobiotics/micronutrients and metabolism, including health consequences.
- Students will also explain and differentiate major mechanisms of xenobiotics/micronutrients, at the molecular and cellular level.
- Students will be able to explore a given topic in this area more in depth and practice effective written form and oral presentation needed by nutritional scientists.

Textbook and required reading:

There is **not a required textbook** for this course; however, a textbook title "Nutrition and Epigenetics" and "Casarett and Doull's Toxicology" will be available for students to check out from the instructor on a 24h basis. Students are expected to review the relevant topics.

Learning Assessment:

- ***Exams*** (Midterm and final exams) -- These will be in class, closed book
- ***Announced Quizzes*** (5 quizzes)
- ***Oral presentations*** – All students are required to give an oral presentation during the semester. Each student is responsible for critical review of recent research papers. The topic may **not be directly** related to your area of research. On the class period prior to your presentation, provide a copy of your abstract to all the students in the class.

▪ ***Term paper*** – Choose a topic (again **not directly** related to your research) to write a term paper. The term paper will be in the section that you have not chosen for oral presentation. It should be a **critical review**. Make sure to write a summary paragraph that includes your critical evaluation/opinion of the topic. The paper should be 4-6 pages (excluding references) typed, double-spaced, accomplished by a detailed abstract, summary, and complete reference list, of information on the current understanding of the mechanism by which xenobiotics/micronutrients. References should include at least 4-6 **original** research articles and should also include pertinent reviews. ***The paper is due no later than November 4 (Friday).***

Grading:

Two Exams (100 points each)	200 points
Term paper assignment	50 points
5 quizzes (10 points each)	50 points
Oral presentation	100 points
Total points	**400 pts (100%)**

Grading is on a straight percentage basis, where 90-100% =A, 80-89% =B, 70-79% =C, 60-69% =D, and less than 60% =F

Academic honesty:

"As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honest and individual integrity prevail."

"Each University of Arkansas student is required to be familiar with and abide by the University's 'Academic Integrity Policy' which may be found at http://provost.uark.edu/ Student with questions about how these policies apply to particular course or assignment should immediately contact their instructor."

Accommodations notice:

If a student wants to request reasonable accommodations for this class due to a disability, he/she must first register with the Center for Students with Disabilities (CSD) and ask the CSD to send an official Accommodation Letter to the instructor during the first two weeks of the semester.

Inclement Weather:

Classes will be held unless the University of Arkansas is officially closed. Listen to local television and radio stations for announcements. If classes are cancelled on a day that a test is scheduled, the test will be administered during the next regularly scheduled class meeting. If class cancellation occurs on the day an assignment is due, it will be due at the beginning of the next class period.

Violence/Active Shooter (CADD):

CALL-911; ***AVOID***-If possible, self-evacuate to a safe area outside the building. Follow directions of police officers; ***DENY***-Barricade the door with desks, chairs, bookcases or any items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it's safe; ***DEFEND***-Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.

Class Schedule:

Week	Topic
1	Overview of course and general introduction Absorption, Distribution
2	Excretion, Pharmacokinetics/Pharmacodynamics Biotransformation (Phase I)
3	Biotransformation (Phase II) Dose-response relationships of phytochemicals
4	How to quantities adverse effects of phytochemicals
5	Adverse effects of nutrients/food components and phytochemicals Bioavailability of phytochemicals/micronutrients
6	Metabolism of EGCG in human Metabolism of Resveratrol in human
7	Metabolism of Isoflavones in human ***Midterm Exam***
8	Metabolism of alcohol in human Fate of sweeteners in human
9	FALL BREAK Safety of dietary supplements
10	Metabolism of St. John's Wort Metabolism of Echinacea
11	Gene expression Gene regulation & Mutation
12	Epigenetics and phytochemicals *Student Presentation*
13	*Student Presentation* *Student Presentation*
14	B-vitamins and methylation THANKSGIVING BREAK
15	Nutritionally relevant compounds
16	Drug-phytochemicals/food interactions Review session
17	***Final Exam***

***The schedule is tentative.**