

**INTD 6033**  
**CELL SIGNALING MECHANISMS**  
**Spring, 2017**

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**CLASS DAYS and TIME:** Monday and Wednesday, 9-11 am, March 20-May 3

**CLASSROOM:** 425D, Biochemistry Conference Room

**COURSE FACULTY:** Jean Jiang, Ph.D. (Course Director), Martin Adamo, Ph.D., Robert Brenner, Ph.D., Bandana Chatterjee, Ph.D, William Clarke, Ph.D, James Lechleiter, Ph.D., Feng Liu, Ph.D., Linda Roman, Ph.D., and Yuzuru Shiio, M.D., Ph.D.

**OFFICE LOCATION and HOURS:** To be arranged with individual faculty

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**TELEPHONE:** Contact faculty by email

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

#### **COURSE DESCRIPTION AND OBJECTIVES**

This course provides a broad background, fundamental knowledges and current research progress in the areas pertinent to cell signaling, regulation and mechanisms. Topics will include major cell signaling mechanisms and pathways, major experimental approaches to study cell signaling and clinical applications.

**Pre-requisites** – Biology with some biochemistry and cell biology knowledge

**Semester credit hours** – 2

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

- Know the major signaling pathways in various organ and cell systems.
- Understand the major experimental approaches in the study of the mechanisms of cell signaling.
- Properly interpret and critically evaluate research data. Keep a close track of current literatures and development in the cell signaling field. Write an essay describing one of major cell signaling pathways discussed in the class.

#### **COURSE ORGANIZATION**

**The main teaching modalities used in this course include:**

- 1) Didactic lectures designed to convey information to the students in traditional lecture format
- 2) In-class discussion on specific topics.
- 3) List teaching modalities and a brief description and/or the purpose of each

**Materials** – Instructors' handouts will be used.

**Computer Access** – Students will need access to a computer and the internet to obtain course materials if applicable.

**Reading Assignments** – Reading assignments will be provided during the lecture.

## **ATTENDANCE**

Attendance is mandatory. Students are expected to attend all classes and to be on time. In cases of illness or other serious event, the student is responsible for all materials presented on that day. There will be no make-ups for missed lectures.

## **TEXTBOOKS**

**Required:** None

**Recommended:** Reading assignments are assigned by individual instructors.

## **GRADING POLICIES AND EXAMINATION PROCEDURES**

The course will have one Final Exam. Grade: Class attendance and participation, 30%; Final exam, 70%.

The instruction for final exam is the following:

Please answer the following general questions concerning the receptor system you have chosen. Try to be concise and limit your answer specifically to the question or request given in each test item (no more than 10 double-spaced pages). If you cannot answer one or more of the questions with specific details, which you have extracted from the literature, answer the question in a prospective fashion, e.g. explain how you would gather the necessary data about your system. This exam is to be completed in the absence of discussion with anyone else.

## **Points**

- 10 1. Describe the molecular properties and origin of the endogenous ligand that binds to your receptor. Also, describe any antagonists that have been developed for your receptor.
- 20 2. Describe the following:
  - a. Molecular properties of your receptor.
  - b. The ligand-receptor binding reaction
  - c. The involvement of any other molecular species that may be required in the interaction of the receptor and the cellular response components
- 20 3. Describe all types of regulation of your receptor
  - a. at the level of the receptor (including receptor distribution and processing).
  - b. at the level of the gene for the receptor.
- 10 4. Describe all intracellular signaling processes (second messengers) in which your receptor is involved.

10. 5. Describe the nature of the cell/organ response initiated through your receptor (include a discussion of specific cellular enzymes or proteins). Also discuss any intercellular or interorgan hormonal actions in which your receptor plays a crucial role and any pathophysiological conditions in which your receptor is involved.

Please complete the exam and send to Dr. Jiang ([jiangj@uthscsa.edu](mailto:jiangj@uthscsa.edu)) by 5:00 pm, Wednesday, May 3, 2017

Grade scales: A = 90-100%    B = 80-89%    C = 70-79%    F = < 69%

#### **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/eoo/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**

All course communication will be conducted by e-mail using the student's Livemail account. Students are expected to check their e-mail accounts regularly and are responsible for materials, assignments, notifications, and test materials distributed by e-mail.

#### **USE OF RECORDING DEVICES**

The use of recording devices is allowed.

#### **ELECTRONIC DEVICES**

Cell phones may not be used in class and must be shut off during class. Laptops or tablets can be used in class for class—related purposes and note taking. They may not be used for e-mail, web surfing, or any activity not related to class.

**TENTATIVE CLASS SCHEDULE**  
**INTD6033**  
**Cell Signaling Mechanisms**  
**Spring, 2017**

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WEEK	DATE	TOPIC		Instructor and Modality
Week 1	03/20/17	Introduction		Jiang
	03/22/17	Seven Membrane-spanning, G protein-coupled Receptors		Clarke
Week 2	03/27/17	Nuclear Receptor Mediated Cell Signaling: Roles in Health, Disease and Drug Response		Chatterjee
	03/29/17	NO Signaling		Roman
Week 3	04/03/17	Tyrosine Kinase Receptor Signaling Systems		Liu
	04/05/17	Adipokine Signaling Systems		Liu
Week 4	04/10/17	Cyclic Nucleotide Signaling Systems		Adamo
	04/12/17	Growth Signaling and Cancer		Shiio
Week 5	04/17/17	Inositol Phosphate/Diacylglycerol/Ca <sup>2+</sup> Signaling Systems		Lechleiter
	04/19/17	Ca <sup>2+</sup> -dependent Signaling		Lechleiter
Week 6	04/24/17	Voltage-dependent calcium channel signaling		Brenner
	04/26/17	Integrin Signaling		Jiang
Week 7	05/03/17	Final exam due		Jiang
Week 8				
Week 9				
Week 10				
Week 11				
Week 12				
Week 13				
Week 14				
Week 15				
Week 16				
Week 17				