

**Fall 2011 Mini Course**  
**BMS 692: Cell Biology - Concepts in Development,  
Self-Renewal and Repair – 1 credit**  
**Class # 011405**

**COURSE DESCRIPTION**

This course examines the similarities and differences between different cell types and their functions. Understanding the molecular basis of cellular compartmentalization components and how cells work is fundamental to all biomedical sciences. Research in cell biology is closely related to developmental biology, molecular biology, and immunology. This course is designed to provide integrative scientific knowledge of cell biology and discusses the relevance of cellular basis of human diseases.

**COURSE REQUIREMENTS**

**Prerequisites:** Enrollment in a BMS graduate degree program, or course director permission. Readings from the scientific literature will be assigned by course director and instructors.

**LEARNING OBJECTIVES**

Understand the biology of cells during embryonic development, cell fate decisions, and tissue repair and self-renewal.

**FACULTY**

**Course Directors:**

Kathy Chou, [yxc10@health.state.ny.us](mailto:yxc10@health.state.ny.us) ESP C345, 474-8969

**Instructors:**

Carmen Mannella, [carmen@wadsworth.org](mailto:carmen@wadsworth.org)

April Burch, [aburch@wadsworth.org](mailto:aburch@wadsworth.org)

**COURSE SCHEDULE**

August 30 to September 27

11:00-12:20 PM, Tuesdays and Thursdays, Room 1041, David Axelrod Institute

**GRADING SCHEME**

A-E.

**STUDENT EVALUATION**

Evaluation will be based on class participation (20%), a final presentation (40%) and a final report (maximum 5 pages; 40%).

**COURSE EVALUATION**

At the end of this mini course, students will be asked to provide feedback on the course for teaching, assignments, classroom environment and general course observations.

## **SCHEDULE FOR FALL2011**

### ***Lecture 1: Course Introduction and Overview (Dr. Kathy Chou)***

Tuesday 8/30

### ***Lecture 2: What is a cell? (Dr. Kathy Chou)***

Thursday 9/01

An introduction to the internal structure, organelles and molecular properties of cells

### ***Lecture 3: The power house of the cell: mitochondria (Dr. Carmen Mannella)***

Tuesday 9/06

The lecture covers the structure and function of mitochondria as well as the mitochondrial diseases and their applications in genetics studies.

### ***Lecture 4: Cell-cell interaction vs. cell-ECM interaction (Dr. Kathy Chou)***

Thursday 9/8

This lecture covers the function of cell junctions. There are two types: those that link cells together to form tissue (intercellular junctions) and those that link cells to the extracellular matrix (focal adhesion).

### ***Lecture 5: Team work of cells: angiogenesis of blood vessel networks (Dr. Kathy Chou)***

Tuesday 9/13

The growth of blood vessels (known as angiogenesis) is essential for organ growth and repair. Angiogenesis involves a group of different types of cells: endothelial cells, pericytes, and smooth muscle cells. This lecture covers the basics of how cells work together in angiogenesis process.

### ***Lecture 6: The concept of stem cell therapy (Dr. Kathy Chou)***

Thursday 9/15

Stem cells are known as the most promising cell types to treat human diseases and the field receives the most significant public attention both nationwide and locally. This lecture covers subjects about the public impact on medical, social, legal and ethical concerns related to the stem cell therapies.

### ***Lecture 7: Viruses and Cells: Treacherous tools for therapy and cell biology (Dr. April Burch)***

Tuesday 9/20

This lecture discusses viruses and modification of cellular structures and how virology tricks can be used to manipulate cells.

### ***Lecture 8: Good cells gone bad: cancer stem cell theory (Dr. Kathy Chou)***

Thursday 9/22

When cells undergo uncontrolled divisions, they can potentially lead to cancer. This lecture covers the benign and malignant growths of cells, the common treatment of cancers and a potential revolution view of stem cells and the cancer connection.

### ***Lecture 9: Student Presentations, Final Reports Due and Course Evaluation (Dr. Kathy Chou)***

Tuesday 9/27