

**BIOT 6335****Tissue Culture****Credit Hours: 3****Semester:** Summer - Long  
**Class Day/Time:** Mondays, 1-4**Year:** 2013  
**Class Location:** Lab B4**Instructor of Record:** Dr. Amy Tvinnereim

Professor

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Office Hours: Wed 4-5, Thurs 4-5

**Course Description:** Basic cell culture techniques with a focus on mammalian cell lines. The course will cover the basic requirements of cells grown in culture, sterile technique for handling cells, and methods for transforming and separating cells.

**Prerequisite:** As per program admission**Co-requisite:** None**Goals of Course & Course Objectives:***Course Objectives:*

1. Understand the basic requirements for growing mammalian cells in culture
2. Understand sources of contamination, methods to prevent contamination, and identify contaminated cell cultures.
3. Understand methods to assess cell viability
4. Understand methods commonly used to transform and select cells.
5. Understand techniques used to assess cell protein expression
6. Demonstrate ability to grow and main adherent and suspension cell cultures without contamination
7. Demonstrate ability to freeze viable cells and recover these cells for future use
8. Demonstrate ability to prepare cells to be used in assays
9. Demonstrate ability to transform and isolate clones from cell lines
10. Isolate and grow primary cells

**Student Learning Outcomes (Course Competencies):**

1. The student will be able to describe the basic components of culture media and the conditions required to grow and maintain cells in culture.
2. The student will be able to explain sterile technique used for growing cells in culture, the sources of bacterial and fungal contamination and be able to identify contamination.
3. The student will be able to demonstrate techniques used to transform, identify, and isolate cells of interest.
4. The student will be able to preserve and retrieve cells for future use
5. The student will be able to isolate and culture primary cells
6. The student will be able to prepare cells for assays

*Subject-specific Skills:*

Students who successfully complete Cell Culture Techniques will be able to:

- Perform all common cell culture techniques
- Grow and maintain cells without contamination
- Maintain appropriate records for the growth and maintenance of cell cultures
- Perform advanced cell culture techniques including isolation, transformation, and selection
- Evaluate cell health, viability, and functional properties.

**Course Assessment/Methods of Evaluation:**

The students understanding will be evaluated with a written record (lab notebook and protocol manual) of all techniques and procedures performed.

Laboratory notebook (100 points)

Protocol Manual (100 points)

**Grading**

Grades will be based on the following scale

A – 90 – 100%

B- 80-89

C- 70-79

D- 60-69

Any grade below a D is failing. Any grade below a B is unacceptable for graduate school and may be considered an academic deficit.

**Linked Program Learning Outcomes:**

The student learning outcomes listed above address the following Biotechnology Program PLOs:

- PLO-2. The student will demonstrate mastery of basic and advanced biotechnology methods

**Textbook:**

None.

**Course Content:**

- Setting up a Tissue Culture Lab
  - Equipment required
  - Care of Equipment
  - Setting up Labs for Class
- Media Preparation
  - Working in a BSC
  - Sterile technique
  - Preparing Media
- Growing Continuous Cell lines
  - Evaluating cell health/viability/confluence
  - Counting cells
  - Subculturing and maintaining cell lines
- Preparing Cells for Assays
  - Cytospins,
  - Preparing and handling coverslips,
  - Setting up plates
- Immunofluorescent/Immunohistochemical staining of cells
  - Immunofluorescent staining of cover slips
  - Immunohistochemistry of cytopins
- Freezing cell lines
  - Preparation of freezing media

- Freezing cells
- Long-term storage of frozen cells
- Starting cultures from frozen Stocks/starting cultures from primary cells/cell selection techniques
  - Thawing cells
  - Testing viability of frozen stocks
  - Starting alloreactive CD8+ T cell cultures
  - Cell separation by density gradient
  - Selection of CD8+ cells using magnetic beads
- Cloning and Selection of Clones
  - Limiting dilution cloning of alloreactive CD8+ T cells
- Stimulating clones/determining if cells are clones.

### **Other Class Policies:**

#### **Attendance:**

Regular or punctual attendance is expected. If a student misses a class or lab, the student is responsible for obtaining any information distributed during those times. Make-ups are possible only under certain instances (labs cannot be made up). Arrangements for any make-ups and/or missed labs should be discussed directly with the instructor for that day's class.

#### **Academic Honesty:**

Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic 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 examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

#### Cheating

Dishonesty of any kind involving examinations, assignments, alteration of records, wrongful possession of examinations, and unpermitted submission of duplicate papers for multiple classes or unauthorized use of keys to examinations is considered cheating. Cheating includes but is not limited to:

- Using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class.
- Falsifying or inventing any information, including citations, on an assigned exercise.
- Helping or attempting to help another in an act of cheating or plagiarism.

#### Plagiarism

Plagiarism is presenting the words or ideas of another person as if they were your own. Materials, even ideas, borrowed from others necessitate full and complete acknowledgment of the original authors. Offering the work of another as one's own is plagiarism and is unacceptable in the academic community. A lack of adequate recognition constitutes plagiarism, whether it utilizes a few sentences, whole paragraphs, articles, books, audio-visual materials, or even the writing of a fellow student. In addition, the presentation of material gathered, assembled or formatted by others as one's own is also plagiarism. Because the university takes such misconduct very seriously, the student is urged to carefully read university policies on Misconduct in Research and Other Scholarly Activity 05.00. Examples of plagiarism are:

- Submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another.
- Submitting a work that has been purchased or otherwise obtained from an Internet source or another source.
- Incorporating the words or ideas of an author into one's paper without giving the author due credit.

#### **Adding/Dropping:**

The official deadline for adding and dropping courses is as published in the academic calendar and Graduate Bulletin (typically the day before Census Day). However, students are strongly encouraged to meet with their graduate advisor or the Program Coordinator prior to adding/dropping courses. Movement into and out of classes after the 4th class day requires approval of the Program Director. Students can drop



until mid-semester without a WP or WF. Drops after mid-semester require approval of the Dean. Each student is responsible for their own enrollment status with the university.

**Disability Accommodations:**

UTHSCT abides by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act, which mandate reasonable accommodations be provided for students with documented disabilities. If you have a disability and may require some type of instructional and/or examination accommodations, please contact me early in the semester so that I can provide or facilitate provision of accommodations you may need. If you have not already done so, you will need to register with the Student Services Office (located on the UT Tyler Campus). You may call 903-566-7079 for more information.