# Biological Sciences 260
## Tissue Culture and Staining
## (Summer Quarter 2004)

Instructor: Dr. Stephanie Namciu
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Phone: 206-667-5218
Office Hours: T 5:00-6:00 PM

Lecture: T,Th 6:00-7:00 PM
Room: SCCC, 5th Floor, Rm. 5135

LAB: T, Th 7:00-9:15 PM
Room: SCCC, 5th Floor, Rm. 5135

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**Textbook and Supplies:**

CULTURE OF ANIMAL CELLS, R. Ian Freshney, Wiley-Liss, Inc., Fourth Edition.

TISSUE CULTURE TECHNIQUES, and Introduction: Bernice M. Martin, Birkhauser.

**Supplies:** Any brand of bound notebook (non-removable pages), blue and/or black ink pens, permanent laboratory markers (any color(s), but must be water and alcohol resistant), lab coat (optional).

**Course Description:** The goal of this course is to give the student a solid foundation in the theory and techniques of cell culture, preparing them for job placement in either academic or industry research settings. The main focus of this course will be cell culture techniques, therefore, the majority of the class time will be utilized for laboratory exercises.

***Assignments:***

**Lecture**

Reading assignments for each lecture are listed below, and it is recommended that students read these assignments before coming to class.

**Lab**

Instructions for notebook organization and content will be given the first day of class. Notebooks will be turned in for review every Thursday, and will be returned the following Tuesday. **Your writing must be legible.**

***Testing:***

There will be three quizzes that will cover the material presented in lecture and lab exercises. In addition, there will be a comprehensive final the last day of class. **Make-up quizzes/exam will**

**be given only under extraordinary circumstances**. If you thing you have an extraordinary circumstance, let me know as soon as possible before the test date.

**Cheating/Plagiarism**: Anyone caught cheating on an exam, or plagiarizing their lab notebooks will receive a zero for that exam or lab.

***Points:***

| | | |
|---|---|---|
| 3 quizzes (30 points each) | | 90 points |
| 3 skills checks (15 points each) | | 45 points |
| 12 Labs | | 180 points |
| Notebooks (bi-weekly) | | 40 points |
| Conprehensive Final__ | | _60 points |
| | Total | 415 points |

**BioSci 260 Summer 2004 Calendar and Schedule**
***Schedule may be subject to change. ***

**Texts**:
Culture of Animal Cells
*Tissue Culture techniques*

| Week | Date | Lecture | Texts | Activities | Laboratory |
|---|---|---|---|---|---|
| 1 | 6/22 | **Introduction to Cell Culture**: **1**. Class organization. **2**. T.C. as a research tool. **3**. Aseptic Technique. | Ch.1,4,5,6, 12<br>Ch. 20 pp309-313<br>*Ch 2, pp5-13, Ch 3, 54-62* | Learn how to count cells. | Count and seed adherent and non-adherent cells for (antibiotic) toxicity test. |
| | 6/24 | **Cell Lines**: Types, Culture vessels and media. | Ch. 7,8,17<br>*Ch. 3, pp 29-54* | Propagate and maintenance of cell cultures. | Start toxicity test. |
| 2 | 6/29 | **Introduction of exogenous DNA and expression of proteins in cell cultures I**: Stable Transfection | Ch. 27, pp455-462<br>*Ch. 8, pp165-178* | | **1**. Results of toxicity test.<br>**2.** Stable transfection of adherent cells. |
| | 7/1 | **Culture Contamination** | Ch. 18<br>*Ch. 3, pp 66-72* | **Quiz 1** | **1.** Select Stable Trans. |
| 3 | 7/6 | **Introduction of exogenous DNA and expression of proteins in cell cultures II:** | | | **1**. Transient transfection of non-adherent cells.<br>**2**. Transduce non- |

| | | | | | |
|---|---|---|---|---|---|
| | | Transient Transfection & Retrovial Transduction | | | adherent cells. |
| | 7/8 | **1.Cloning of Somatic Cells.**<br><br>**2.Microscopy** | Ch. 13<br>*Ch. 7* | Use fluorescence microscope. | **1**. Transient Expression of GFP.<br>**2**. Select Transduced cells. |
| 4 | 7/13 | **Synchronizing the Cell Cycle** -Arrest of Cell Cycle *via* drugs or serum starvation. | Ch. 15, pp242-245<br>Ch. 26, pp431-432 | | **1**. Metaphase Spreads.<br>**2**. Pick non-adherent clones. |
| | 7/15 | **Plating Efficiency** | Ch. 20, pp323-325 | **Quiz 2** | **1**. Serum testing. |
| 5 | 7/20 | **Immunocytochemistry** | Ch. 15, pp254-257 | | **1**. Immunocyto-chemistry - Plate cells. |
| | 7/22 | | | | **1.** Detection of protein using antibodies.<br>**2.** DNA prep. from transduced DT40 colonies. |
| 6 | 7/27 | **Fluorescence *In situ* Hybridization (FISH)**: Chromosome Analysis | Ch. 27, pp443-449 | | **1**. Fluorescence Insitu Hybridization. (FISH)-Hybridization.<br>**2.** DNA prep. |
| | 7/29 | | | | **1.** FISH Detection.<br>**2.** Quantitate DNA.<br>**3.** Serum testing – count colonies. |
| 7 | 8/3 | | | | **1.** Repeat transient transfection of DT40 cells. |
| | 8/5 | FHCRC – Fluorescence Microscope with camera. | | **Quiz 3** | Collect Data for FISH, Immunostaining, and Transient Transfection experiments. |
| 8 | 8/10 | **1. Preparation of Primary Cell Cultures from Tissue.**<br>**2. Cryopreservation** | Ch. 19<br>*Ch. 6* | | **1**. Isolation of primary cells from human foreskins. |
| | 8/12 | | | **Final** | |