

# BIOCHEMISTRY AND MOLECULAR BIOLOGY

## SENIOR SEMINAR/ADVANCED BIOCHEMISTRY

### COURSE INFORMATION

**Term:** Spring 2008, MW 4:30-6:00

**Professor:** Dr. Darlene M. Loprete

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### DESCRIPTION

This course will focus on current techniques and applications in DNA technology. Faculty from St. Jude Children's Research Hospital will present explain cutting-edge techniques used in their research and describe the nature of their project. The students will develop independent learning skills by researching and reporting on one of the topics presented. In addition, students will give a PowerPoint presentation on basic techniques used in biochemistry and molecular biology laboratories.

### EVALUATION

**I. Techniques Presentation** – You and your partner will prepare and present a PowerPoint presentation on two common techniques we will encounter in the primary literature. A separate handout will be given that describes the expectations for these presentations.

### II. Weekly Assignments

**Summary of Assigned Research Article:** You are to submit a summary of the assigned reading each week not to exceed one page single-spaced. In this summary you will provide:

1. an explanation/description of the research question investigated
2. the overall importance/significance of this research question
3. a brief description of the methodology used to investigate the hypotheses
4. major results of the study, and overall conclusions of the author(s)
5. at least 2 questions for discussion that might be appropriate for class discussion. These questions should address issues that you feel require further clarification or concerns you have about the scientific merit of the paper. You should try to answer questions you might have regarding terminology using textbooks, web resources, etc.; if these sources fail there is probably an underlying conceptual issue which needs to be clarified - try to keep your questions at a conceptual level.

**III. PowerPoint Presentation** - You will prepare and make a presentation on your cloned gene.

## **IV. Paper**

You will submit a paper by the end of the semester describing the research on a particular protein that has been cloned and a minimum of two manuscripts where experiments have been done with the cloned product. The format should be similar to a primary literature article.

A running log of the activities and the time spent on those activities will be recorded in a notebook. You are to include dates (date of entry and the date the work was done), times and a brief description of each activity. For example, if you spent an hour doing a literature search this should be recorded and a description of the results of your search should be documented. You will submit your notebook at the end of the semester along with your final paper. You must make all entries within 5 days of the work.

## **GRADING**

A letter grade of "A" corresponds to a score of 90-100%, "B" equals 80 - 90, "C" equals 70 - 80, etc.

|   |      |
|---|------|
| Techniques Presentation                     | 15 % |
| PowerPoint presentation                     | 30 % |
| Term paper                                  | 40 % |
| Weekly assignments<br>& class participation | 15 % |

## **EXPECTATIONS**

We hope this class will be both informative and enjoyable. This is a great chance not only to meet scientists from a leading research institution and discuss their work with them, but also to become better at reading and evaluating scientific literature and communicating what you've learned. We do ask many things of you, but most important is your enthusiasm, curiosity, and interest. If you bring these attitudes to class, you can't help but learn.

As the success of a seminar depends on everyone's participation in class, attendance is required. It goes without saying that reading the assigned articles is necessary if you hope to contribute to the class discussion. Questions are as important as explanatory comments. If there's a concept you do not understand, then you are probably not alone. Stop the presenter before you get totally lost. If you've come up with new questions based on your reading, ask them. The only stupid question is: "Is this a stupid question?" This is an interdisciplinary seminar. There is very little science that goes on today that doesn't involve some degree of collaboration across multiple fields of expertise. In this seminar we want you to learn how to work with others who may not be particularly knowledgeable in your discipline. This takes curiosity and patience; you will always be both a student and a teacher. This is, however, one of the factors that makes the work we do so exciting.

## **POLICIES**

### **1. Paper Topic:**

The topic you choose to report on cannot be used in any way for another class (i.e. – senior seminar). This means that you may not choose a cloning paper for senior seminar nor can you report on the protein chosen for this course.

### **2. Email:**

During the semester I will give you information via email; therefore you will be required to check you email between classes. You will be responsible for any problems or reading I assign over email.

### 3. Attendance:

An unexcused absence will significantly detract from the goals of this class. A serious penalty will be employed – as much as a letter grade reduction.

| <b>Class Meeting</b> |             | <b>Activity</b>  |
|----------------------|-------------|--|
| January              | 9           | Discuss the goals of the course<br>What information can you get from a primary literature article?<br>What should I include in my final paper and oral presentation? |
|                      | 14          | Techniques Presentation  |
|                      | 16          | Techniques Presentation  |
|                      | 23          | Techniques Presentation  |
|                      | 28          | Techniques Presentation  |
|                      | 30          | Techniques Presentation  |
| February             | 4 & 6       | Drs. Charles Mulligan & Geoff Neale (Tour Hartwell Center)   |
|                      | 11 & 13     | Fellow and Dr. Steve White   |
|                      | 18 & 20     | Drs. David Bouck and Taosheng Chen   |
|                      | 25 & 27     | Fellow and Dr. Joe Opferman  |
| March                | <b>3, 5</b> | <b>SPRING BREAK – NO CLASS</b>   |
|                      | 10 & 12     | Drs. Dario Campana & John Coleman  |
|                      | 17 & 19     | Fellow and Dr. Richard Webby   |
|                      | 24 & 26     | Drs. Gerard Grosveldt, Rick Rahija & Chris Calabrese   |
|                      | 31 & 2      | Fellow and Dr. Clinton Stewart   |
| April                | <b>7, 9</b> | <b>CONFERENCE – NO CLASS</b>   |
|                      | 14          | PowerPoint Presentation  |
|                      | 16          | PowerPoint Presentation  |
|                      | 21          | PowerPoint Presentation  |
|                      | 23          | PowerPoint Presentation  |
|                      | 28          | PowerPoint Presentation  |
|                      | 30          | PowerPoint Presentation  |
| May                  | <b>2</b>    | <b>Final Paper and log book due</b><br><b>(presenters on the 28<sup>th</sup> and 30<sup>th</sup>, your paper is due on the 5<sup>th</sup>)</b>                       |

**Dr. Mulligan**

Acute leukemia – dissecting a diseased genome.

**Dr. White**

Structure and function of biological macromolecules; Enzyme mechanisms and drug design

**Dr. Chen**

High Content Screening in Cancer Research and Drug Discovery

**Dr. Opferman**

Apoptosis and Hematopoietic Stem Cell Survival

**Dr. Coleman**

From Research to Patient Treatment: Manufacturing Biological Products under FDA Regulations

**Dr. Webby**

Influenza viruses made to order; generating influenza viruses in the test tube

**Dr. Calabrese**

Radial glia cells are candidate stem cells of ependymoma.

**Dr. Stewart**

Pharmacogenomics and Irinotecan Dosage Adjustment: Did the FDA Get It Right This Time