**Bio 3325 Research Techiques in Molecular Biology Spring 2016**
**Room 247 Thurs 12:30 – 4:50 PM**

**Tentative Syllabus**

| Lab # | Date | Topic |
|---|---|---|
| 1 | Jan 14 | Organizational meeting, review of units. |
| 2 | Jan 21 | Preparing solutions, plates, sterilizing plasticware. |
| 3 | Jan 28 | Handling bacteria, making competent cells, preparing agarose gels. |
| 4 | Feb 4 | Restriction mapping cloned DNA. |
| 5 | Feb 11 | Isolation of human epithelial DNA, amplifying a specific DNA sequence (from the TPA gene) using PCR. |
| 6 | Feb 18 | Isolating human DNA fragments from PCR amplification (from CCR5 gene), subcloning DNA in selectable vectors. |
| 7 | Feb 25 | Bacterial transformation |
| | March 3 | **Spring Recess** |
| 8 | March 10 | Isolating plasmid DNA using boiling mini-preps, restriction mapping subclones. |
| 9 | March 17 | Preparing Southern blots from subcloned DNA. Labelling probe by PCR with biotinylated dUTP. |
| 10 | March 24 | Purification of probe using QIA column, hybridization of Southern blot. |
| 11 | March 31 | Visualize S. blot by ECL detection using Odyssey FC Detection System. |
| 12 | April 7 | Prepare HQ-link plasmid DNA for automated Sanger dideoxy DNA sequencing of CCR5 subclones. |

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| 13 | April 14 | Read chromatograms of DNA sequences and perform PCR to determine heterozygosity of CCR5 locus. |
| 14 | April 21 | Use BLAST program at NCBI to analyze DNA sequence results. Run gel of PCR. You will be given take-home final due in 10 days. Notebooks will be turned in with final. |

**Syllabus for Bio 3325/8807 (continued)**

**1. Course goals:** To introduce the student to the techniques of modern recombinant DNA techniques as well as a conceptual understanding of how these methods can be used to address biological questions.

**2. Prerequisites:** Genetics, Biology 2203. All students enrolled must have passed Biology 2203 with a C- or better. Students who do not have this prerequsite must obtain written permission from me the first week of class. Students are encouraged to take Molecular Biology Bio 3324 or an equivalent course before taking the laboratory course.

**3.** This is a senior level techniques course. You will work in pairs, however, each member of the pair will be graded independently. As many experiments during the semester require at least some work on two to three consecutive days, at least one of the pair must be available for these non-class hours. Fifty per cent of your grade will be based on your lab notebook and an open book final exam. The remaining 50 per cent will be based on my class discussions with you and my impression of your technical skill. This is a small class and therefore you will have opportunity for close interaction with myself and the TA for the course Jonathan Forstater. I expect each group to calculate and prepare all the solutions needed for each experiment. You will pour your own plates, make your own media and sterilize your own glass and plasticware. I hope this will prepare you for a research position in an academic laboratory or in a biotechnology company. Your lab notebook is extremely imporant for organizing and interpreting research data. It should be organized as follows:

1) The date of each experiment should be entered.
2) The overall aim of the experiment should be indicated.
3) Any background information should be listed.
4) Show all calculations and indicate the exact details of how media and solutions were prepared.
5) Write out step by step exactly what you plan to do in a given lab period, and therefore you should have studied the protocols **before** showing up.
6) Write up the details of what you actually ended up doing, any changes or problems with the protocol, or any relevant observations during the experiment.
7) Write out the results of each experiment, even if they are negative.
If something goes wrong at a given step, you are responsible for repeating that step so that you can continue with the rest of the class, as some weeks the experiments are continuing.
8) Indicate at the conclusion of each experiment the interpretation of the results if relevant or any improvements in the protocol that might be tried.

I do random spot checks of your notebook during the semester so please keep up to date.

**4.** Many of the experiments during the semester continue through multiple laboratory exercises and therefore you must successfully complete one experiment before proceeding to the next experiment. Therefore, if you fail or make an error, you are expected to repeat the experiment during the following week **before** the next scheduled laboratory. There is no penalty for repeating an experiment multiple times. You may use the laboratory room during non class hours, as your schedule permits, with my permission to complete experiments. Students who successfully complete all laboratory exercises regardless of the

number of attempts generally receive an A. In this way, this course accurately reflects authentic research laboratory situations, in that researchers are expected to repeat experiments as many times as it takes to accomplish a goal. If you are sick or need to miss a laboratory, I must be notified in advance to either allow you to perform the exercise early or make it up during the week. Students who have unexcused absences from laboratories will be dropped from the course.

**5**. You may drop this course by **Monday January 22, 2016** with your advisor's signature with no record of this course appearing on your transcript. You may withdraw from this course by **Tuesday March 15, 2016** but a **W** will appear on your transcript. After March 15, all students who fail to complete the work for all laboratories or take the final exam will receive a grade of **F**.

**6.** You may get an incomplete (I) only if you have completed the majority of the work in the course and are passing and only for reasons beyond your control. You must sign a written agreement with me, filed with the department, regarding the requirements for completion of the course and the date by which the work will be completed. Typically this is within one year of enrolling in the course.

**7.** I will hand out written laboratory protocols a week **before** the laboratory meets. Copies of these protocols will also be available for download on Blackboard under this course name. Students are expected to review the exercise **before** coming to class, as they often require prior calculations. I will hand out a list of all student emails so that you can communicate with your laboratory partner and other students in the class.

Any student who has need for accommodation based on the impact of a disability should contact me privately to discuss the specific situation as soon as possible. Contact Disability Resources and Serivces at 215-204-1280.

**8. Cheating:** All students are expected to abide by the University policy regarding academic honesty. The written take-home final is to be taken individually, although students are permitted to consult the literature. If I believe that two exams were written in collusion, the students will be reported to the Academic Disciplinary Committee and if found to have violated University policy, both students will receive a grade of **F**.

**9.** If you need to see me during non-classroom hours, please tell me in advance so I can create a block of time to see you. My office is in 343 BL. My email is: palter@temple.edu. The TA for the course, Jonathan Forstater's email is: tuf06817@temple.edu and his phone is. He can be found in rm BL340.

Karen Palter