

Biology 2180
Fundamentals of Life
Science II Lab
Honors

Spring Semester 2013

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Biology 2180 Honors Lab

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Teaching Assistant: Meenakshi Bhansali

Meeting: Tuesdays 9-11:50 AM in WO 1212

| Week | Date | Lab | Title |
|------|---------|---|--|
| 1 | Jan. 8 | 1 | Introduction to Lab Techniques |
| 2 | Jan. 15 | 2A | Cell Components I (Mini Lab report due) |
| 3 | Jan. 22 | 2B | Cell Components II |
| 4 | Jan. 29 | 2C | Cell Components III |
| 5 | Feb. 5 | 2D | Cell Components IV |
| 6 | Feb. 12 | 3 | Introduction to Proteins |
| 7 | Feb. 19 | 4A | Western Blot of Liver Samples |
| 8 | Feb. 26 | 4B | Western Blot of Liver Samples |
| 9 | Mar. 5 | <i>Spring Break</i> | |
| 10 | Mar. 12 | 5 | Liver Marker Enzyme Assay |
| 11 | Mar. 19 | 6 | Enzyme Kinetics (<i>Full Lab Report #1 Due</i>) |
| 12 | Mar. 26 | 7 | Introduction to DNA |
| 13 | Apr. 2 | 8 | DNA Fingerprinting (<i>Full Lab Report #1 Revised Due</i>) |
| 14 | Apr. 9 | 9A | Recombinant DNA I |
| 15 | Apr. 16 | 9B | Recombinant DNA II |
| 16 | Apr. 23 | 9C | Recombinant DNA III |
| 17 | Apr. 30 | <i>Full Lab Report #2 and lab notebooks due</i> | |

This lab examines introductory cell biology, molecular biology, and biochemistry. Students are first introduced to cells. Cells are then split into their components for later analysis and the purity of these fractions is determined. In this way, the whole cell is tied to the functions of its components. Later labs examine two important cell components- proteins and DNA. Students will be exposed to modern techniques of cellular and molecular biologists while learning the basics of cell biology and biochemistry.

GRADING

Grades will be based upon:

| | |
|--|---------|
| Quizzes, 10/14 worth 10 pts each. | 100 |
| Lab notebook, worth 30 pts. | 30 |
| Mini lab report | 20 |
| Full lab reports, two, worth 100 pts each. | 200 |
| | ----- |
| Total | 350 pts |

I. Quizzes

These will be given during each meeting except the first one and will cover material for the lab of that day.

II. Lab Notebook

A notebook with sewn binding (no spiral binding or loose-leaf paper) which should catalog what you have done in the lab. It should have in an organized fashion the following:

- Notes on each experiment.
- Data on each experiment.
- Conclusions on each experiment.
- Any changes in the protocols.

III. Lab Reports

There will be three reports to turn in, one mini report covering only Lab 1 and two full lab reports, one covering labs 2-5 and the other covering labs 7-9. Your lab reports should be written as described in this manual. The purpose of the mini lab report is to familiarize you with the structure of the lab report and therefore will be worth only 20 points. The full lab reports will be graded according to the following:

| | <u>Full</u> | <u>Mini</u> |
|-----------------------|-------------|-------------|
| Abstract | 10 | 2 |
| Introduction | 10 | 3 |
| Materials and Methods | 5 | 1 |
| Results | 60 | 10 |
| <u>Discussion</u> | <u>15</u> | <u>4</u> |
| Total | 100 pts | 20 pts |

Note the following:

- 1) The first full lab report, covering labs 2-5, can be revised and handed in for re-grading, if you wish. There will be no re-grading of the second full lab report.
- 2) There will be no lab report due for the Enzyme Kinetics lab (Lab 6) but you are required to have all the data in your lab notebook.
- 3) Lab reports are due at beginning of class. Ten points/day will be taken off for reports turned in late.

ATTENDANCE

Laboratories will begin promptly and most require the full class time. Instructions will be given at the outset. Therefore, you should try very hard not to be late. If you must miss a lab, make sure you notify the instructor and your lab partner prior to the lab.

PREPARATION

In many experiments, you will be working with live cells or cell homogenates. The morphological structures are fragile and the biochemical components (especially proteins and RNA) are easily degraded due to the presence of proteases and RNases. Make sure you understand the purpose of the experiment, the sequence of steps, and the operation of the equipment before you begin the experiment. Quizzes will contain questions pertaining to the procedure you are about to perform in order to encourage you to understand the lab before you start.

GROUP WORK

All experiments will be done in groups of two. Come prepared for lab for the benefit of yourself and your partner.

LAB REPORT

See Appendix B.

Note:

- There is to be no food/drinks in the laboratory.**
- Mouth-pipetting is not allowed.**