

AP Biology Lab 6 – Molecular Biology

Go to the Lab Bench link on the lab section of the class website. Navigate to Lab 6 – Molecular Biology. Follow the format provided below to write up the lab in your lab notebook. Answers and explains must be detailed and thorough. We most likely will not have a chance to do this lab in class , so use the virtual lab to become familiar with one of the fundamental processes in biotechnology.

Introduction:

- A. What is the purpose of the lab?

6-I Bacterial Transformation

For each key concept read the information and explain the main idea

- B. Key concept 1 – Bacterial transformation
 - a. Concept 1 – bacterial colonies
 - b. Concept 2 – E.Coli bacteria
 - c. Concept 3 – Plasmids
 - d. Concept 4 – competent cells

Design of the Experiment I

- C. Exercise 1 – Transformation
 - a. What are the sterile procedures?
 - b. Write the steps to the procedure. Include the controls and what amp^R represents
 - c. A closer look: illustrate what is happening during transformation (step 1-6)
- D. Exercise 2 – Transformation Procedure Animation (watch animation)
- E. Exercise 3 – write the correct order for the transformation process
- F. Analysis of results I
 - a. Record the results (draw and explain each of the plates)
 - b. Label the results
- G. Lab Quiz I – take the quiz and record your results

6-II DNA Electrophoresis

- H. For each key concept read the information and explain the main idea
 - a. Electrophoresis
 - b. Concept 1 – Restriction Enzymes
 - c. Concept 2 – Cutting DNA
 - d. Concept 3 – Gel Electrophoresis

Design of the experiment II

- I. What are the samples you will be working with? Provide a BRIEF overview
 - a. Exercise 1 - write the procedure for gel preparation
 - b. Exercise 2 – write the procedure for gel loading
 - c. Exercise 3, 4, 5 – describe how the electrophoresis gel are set up and run
 - d. Exercise 6 – explain the staining process and draw the image of a stained gel

- J. Analysis of Results II
 - a. What is a marker?
 - b. How is the size of DNA fragments determined?
 - c. How is a standard curve made? Sketch the gel diagram and record your answers for the measured distance for each base pair
 - d. How does the standard curve relate to the physical gel?
 - e. Practice problem 1 – complete the problem and record your answers
 - f. Practice problem 2 – complete the problem and record your answers

- K. Lab Quiz II – take the quiz and record your score