

Dna fingerprinting essay sample

[Science](#), [Biology](#)



This lab must be typed. Title DNA Fingerprinting Purpose Why are we doing this lab Background 1. What are restriction enzymes 2. When added to a DNA sample, what do restriction enzymes do 3. What do you call the specific sequence of bases the enzyme is searching for 4. What is a restriction digestion 5. What is the purpose of the water bath 6. The electrophoresis apparatus creates an electrical field with positive and negative poles at the ends of the gel. DNA molecules are negatively charged. To which electrode pole of the electrophoresis field would you expect DNA to migrate Explain. 7. What color represents the negative pole 8. After DNA samples are loaded into the sample wells, they are forced to move through the gel matrix. What size fragments (large vs. small) would you expect to move toward the opposite end of the gel most quickly Explain. 9. Which fragments (large vs. small) are expected to travel the shortest distance from the well Explain. Materials List everything you used in the lab. Procedure List steps according to the handout. Day 1 and Day 2 Day 1 Observations 1. Describe the DNA samples. 2. Describe the restriction endonuclease mix. 3. Can you see any evidence to indicate that your samples of DNA were fragmented or altered in any way by the addition of EcoRI/PstI Explain.

In the absence of any visible evidence of change, is it still possible that the DNA samples were fragmented Explain your reasoning. 5. After the restriction digest incubation period, are there any visible clues that the restriction enzymes may have in some way changed the DNA in any of the tubes Explain your reasoning. Day 2 Post Lab Observation of Results Sketch your result to the left. Dry your gel as instructed. Quantitative Analysis of DNA Fragment Sizes If you were on trial or were trying to identify an

endangered species, would you want to rely on a technicians eyeball estimate of a match, or would you want some more accurate measurement In order to make the most accurate comparison between the crime scene DNA and the suspect DNA, other than just a visual match, a quantitative measurement of the fragment sizes needs to be completed. This is described below 1. Using a ruler, measure the distance (in mm) that each of your DNA fragments or bands traveled from the well. Measure the distance from the bottom of the well to the center of each DNA band and record your numbers in the table below.

The data in the table will be used to construct a standard curve and to estimate the sizes of the crime scene and suspect restriction fragments. To make an accurate estimate of the fragment sizes for either the crime scene or suspect DNA samples, a standard curve is created using the distance (x-axis) and fragment size (y-axis) data from the known HindIII lambda digest (DNA marker). Using both linear and semilog graph paper, plot distance versus size for bands 2-6. On each graph, draw a line of best fit through the points. Extend the line all the way to the right-hand edge of the graph. Which graph provides the straightest line that you could use to estimate the crime scene or the suspects fragment sizes Why do you think one graph is straighter than the other Decide which graph, linear or semilog, should be used to estimate the DNA fragment sizes of the crime scene and suspects. Justify your selection. To estimate the size of an unknown crime scene or suspect fragment, find the distance that fragment traveled. Locate that distance on the x-axis of your standard graph. From that position on the x-axis, read up to the standard line, and then follow the graph line over to the

y-axis. You might want to draw a light pencil mark from the x-axis up to the standard curve and over to the y-axis showing what you've done. Where the graph line meets the y-axis, this is the approximate size of your unknown DNA fragment.

Do this for all crime scene and suspect fragments. Compare the fragment sizes of the suspects and the crime scene. Is there a suspect that matches the crime scene? How sure are you that this is a match?

Electrophoresis data Measure the distance (in millimeters) that each fragment traveled from the well and record it on the table. Estimate its size, in base pairs, by comparing its position to the HindIII lambda DNA markers. Remember some lanes will have fewer than 6 fragments.

Analysis/Conclusions Write all answers in complete sentences. 1. What can you assume is contained within each band? 2. If this were a fingerprinting gel, how many samples of DNA can you assume were placed in each separate well? 3. What would be a logical explanation as to why there is more than one band of DNA for each of the samples.

4. What caused the DNA to become fragmented? 5. Which of the DNA samples have the same number of restriction sites for the restriction endonucleases used? Write the lane numbers. 6. Which sample has the smallest DNA fragment? 7. Assuming a circular piece of DNA (plasmid) was used as starting material, how many restriction sites were there in lane three? 8. From the gel sketch, which DNA samples appear to have been cut into the same number and size of fragments? 9. Based on your analysis of the gel, what is your conclusion about the DNA samples? Do any of the samples seem to be from

the same source If so, which ones Describe the evidence that supports your conclusion.