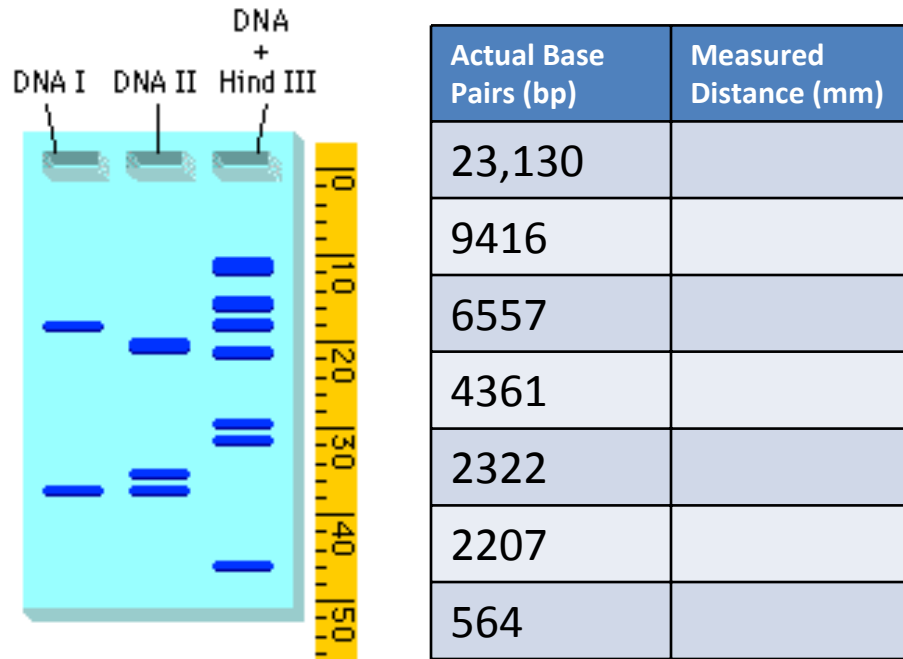
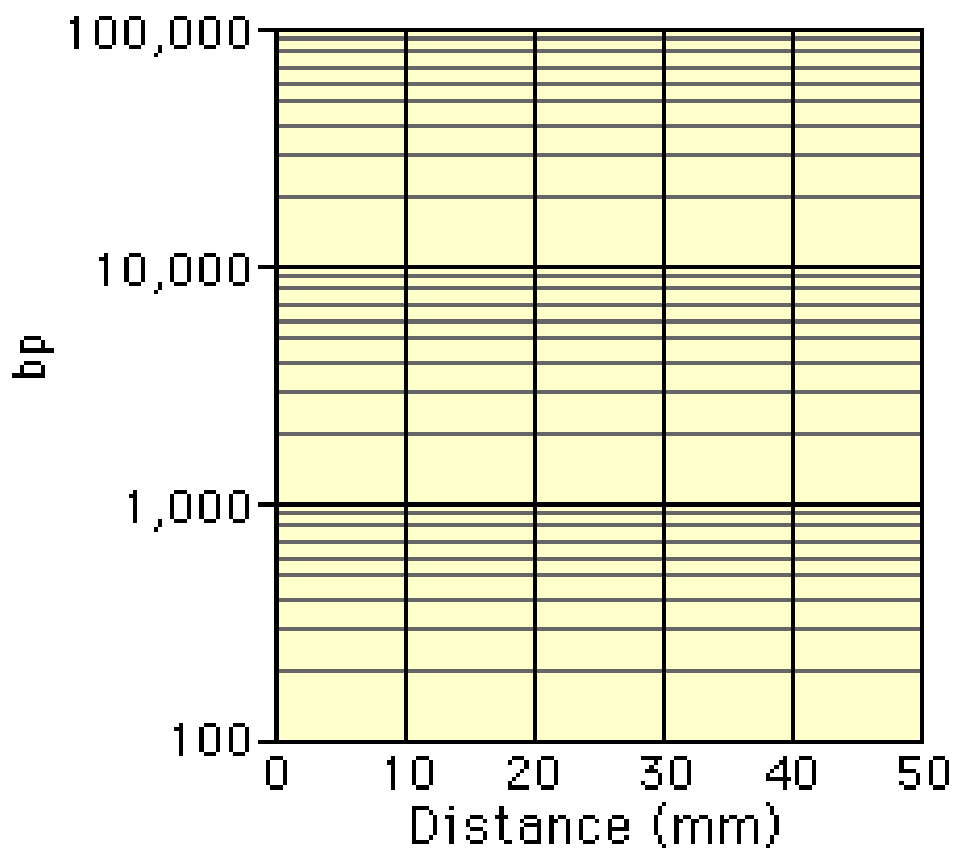


Building a Standard Curve

1. Measure the distance of each HindIII fragment migrated on the gel and then complete the chart.



2. Plot the data obtained above on the semi-log graph paper.

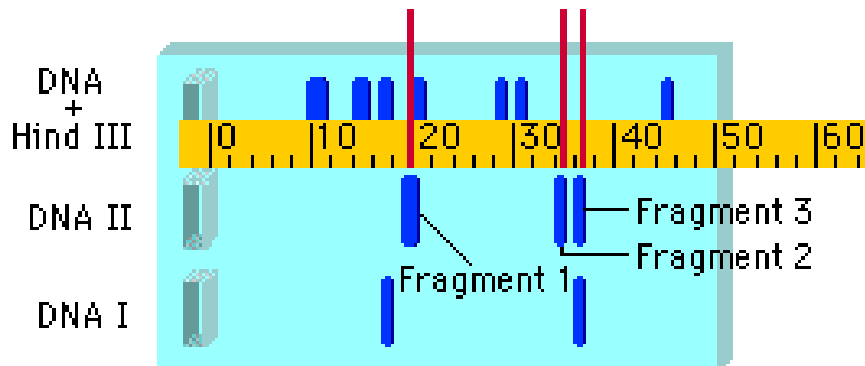


3. What are the three fragment sizes in DNA I?

1. Find the distance migrated for each unknown fragment size of the sample DNA II.

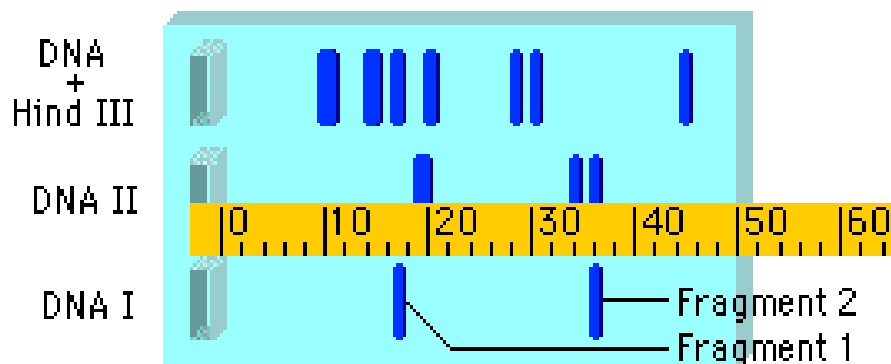
2. Locate this distance on the graph and follow the line to its intersection with the standard curve.

3. Read the number of base pairs in the unknown fragment from the graph. Record your answers in the table below.



| | Distance Migrated (mm) | Interpolated Fragment Size (bp) |
|------------|------------------------|---------------------------------|
| Fragment 1 | | |
| Fragment 2 | | |
| Fragment 3 | | |

4. What are the two fragment sizes in DNA I?



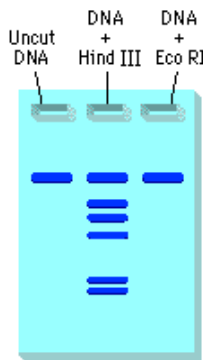
| | Distance Migrated (mm) | Interpolated Fragment Size (bp) |
|------------|------------------------|---------------------------------|
| Fragment 1 | | |
| Fragment 2 | | |

Molecular Biology and Genomics Quiz

Name: _____

Date: _____

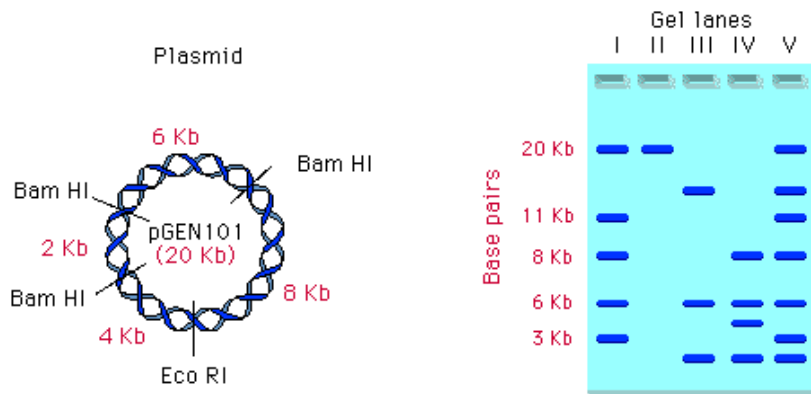
- Which of the following statements is correct?
 - Longer DNA fragments migrate farther than shorter fragments.
 - Migration distance is inversely proportional to the fragment size.
 - Positively charged DNA migrates more rapidly than negatively charged DNA
 - Uncut DNA migrates farther than DNA cut with restriction enzymes.
- An instructor had her students perform an experiment beginning with setting up their own restriction enzyme digestions. One team of students had results that looked like the gel below. What is the most likely explanation for these results?



- The students did not allow enough time for the electrophoresis separation.
 - The agarose preparation was faulty
 - The ethidium bromide did not stain the DNA evenly.
 - The restriction enzyme EcoRI did not function properly.
 - The voltage was set too low on the apparatus.
- A mutation that results in the formation of a stop codon and subsequently premature termination of protein synthesis is a
 - Frameshift mutation
 - Nonsense mutation
 - Missense mutation
 - Silent mutation
 - What is the molecular biology technique used to visualize the results of a restriction digestion?
 - Centrifugation
 - Polymerase Chain Reaction
 - Gel electrophoresis
 - Plasmid miniprep
 - What is the genetic function of restriction enzymes?
 - Joins nucleotides during replication
 - Adds new nucleotides to the growing strand of DNA
 - Joins nucleotides during transcription
 - Repairs breaks in sugar phosphate backbones
 - Cleave nucleic acids at specific sites

Below is a plasmid with restriction sites for BamH1 and EcoR1. Several restriction digests were done using these two enzymes either alone or in combination. Use the figure to answer questions 6-8.

Hint: Begin by determining the number and size of the fragments produced with each enzyme.



6. Which lane shows the digest for BamH1 only?

- A. I
- B. II
- C. III
- D. IV
- E. V

7. Which lane shows the digest for EcoRI only?

- A. I
- B. II
- C. III
- D. IV
- E. V

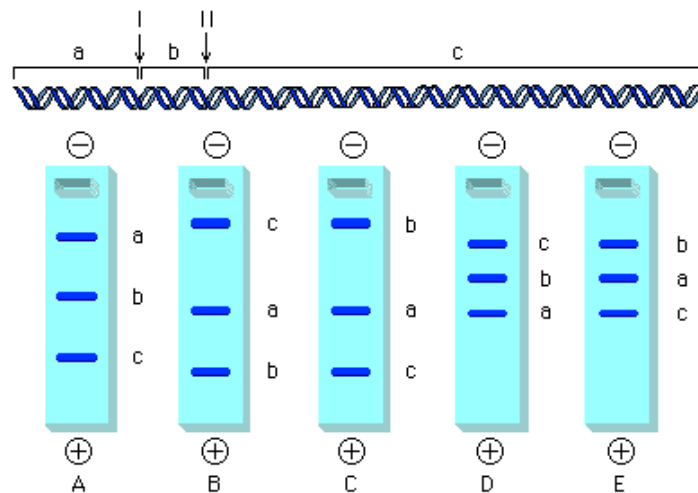
8. Which lane shows the fragments produced when the fragment was incubated with both EcoRI and BamHI?

- A. I
- B. II
- C. III
- D. IV
- E. V

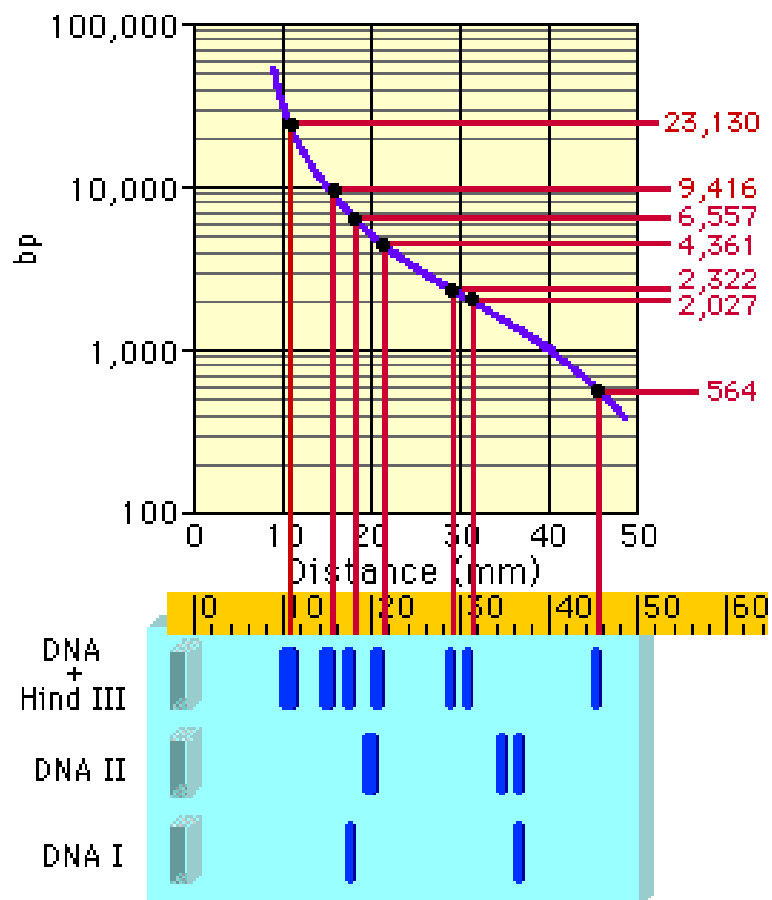
9. What is the major difference between HNPCC and FAP?

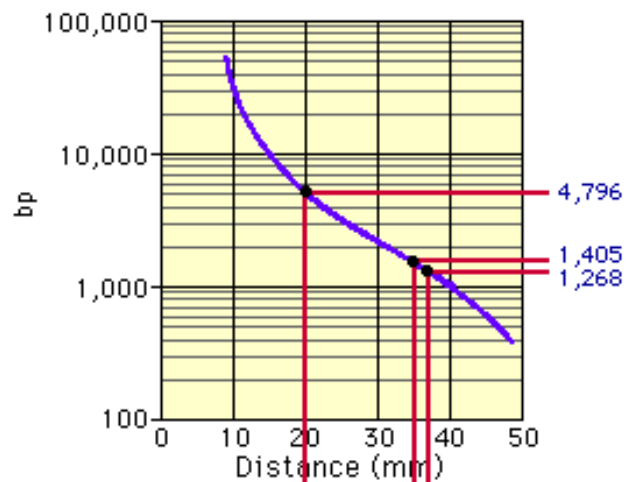
- A. HNPCC is hereditary and FAP is non-hereditary.
- B. FAP is hereditary and HNPCC is non-hereditary.
- C. HNPCC is caused by a defect in genes important for tumor suppression and APC is caused by a defect in genes important for mismatch repair.
- D. HNPCC is caused by a defect in genes important for mismatch repair and APC is caused by a defect in genes important for tumor suppression.
- E. They are both the same.

10. A segment of DNA has two restriction sites (I and II). When incubated with restriction enzymes I and II, three fragments will be formed- a, b, and c. Which of the following gels produced by electrophoresis would represent the separation and identity of these fragments?

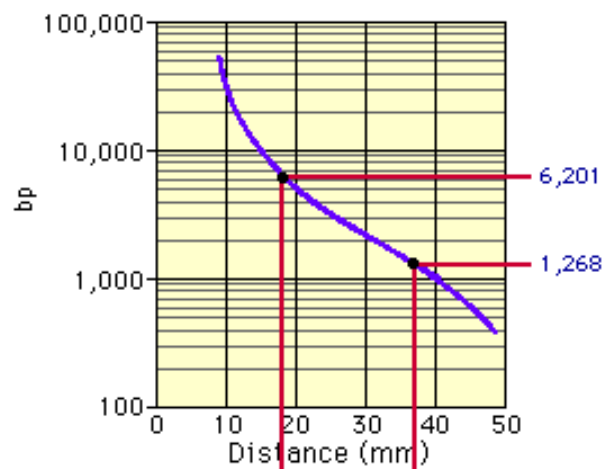
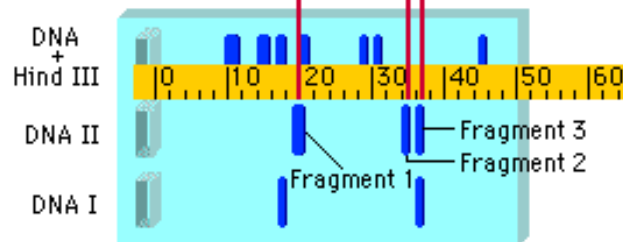


| Actual Base Pairs (bp) | Measured Distance (mm) |
|------------------------|------------------------|
| 23,130 | 11 |
| 9,416 | 16 |
| 6,557 | 18 |
| 4,361 | 22 |
| 2,322 | 29 |
| 2,027 | 32 |
| 564 | 46 |





| | Distance Migrated (mm) | Interpolated Fragment Size (bp) |
|------------|------------------------|---------------------------------|
| Fragment 1 | 20 | 4796 |
| Fragment 2 | 34 | 1405 |
| Fragment 3 | 36 | 1268 |



| | Distance Migrated (mm) | Interpolated Fragment Size (bp) |
|------------|------------------------|---------------------------------|
| Fragment 1 | 17 | 6201 |
| Fragment 2 | 36 | 1268 |

