

Name: _____ Date: _____ Period: _____

Biology: Biochemical Evidence for Evolution

Background Information: If two organisms have similar DNA molecules, they must have similar amino acids and thus similar proteins. Therefore, DNA comparisons can be made by examining the sequences of amino acids within a protein.

Scientists have long believed that similar DNA sequences indicate a common origin and ancestor. The more similar the DNA of two living organisms, the more closely related they may be to one another. Hemoglobin, a protein in red blood cells, has been studied. Scientists know the specific amino acids and their arrangements in hemoglobin molecules of humans, gorilla, and horses.

In this investigation, you will

- a. count and record the molecules of each amino acid present in similar portions of humans, gorilla, and horse hemoglobin.
- b. Count and record differences in the sequence of amino acids in similar portions of human, gorilla, and horse hemoglobin.
- c. Use this data to show how biochemical evidence can be used to support evolution.

Procedure

Part A: Amino Acid Sequence

- 1) Read the amino acid sequences from left to right beginning at the upper left hand corner of figure 39-1. Compare the sequences of humans to the sequences of gorillas and horses. An example of a sequence difference between humans and horses is shown in figure 39-1.
- 2) Record in Table 39-1 the total number of differences in the sequences of gorilla and human amino acids. Then repeat this for horse and human, and for gorilla and horse.

Table 39-1. Number of Amino Acid Sequence Differences

Organisms	Number of Differences
Gorilla and Human	
Horse and Human	
Gorilla and Horse	

Using the information you collected, graph the differences between the three organisms below. Be sure to title your graph and label both axes.

