

BIOCHEMICAL EVIDENCE OF EVOLUTION

If two organisms have similar DNA molecules, they have similar proteins. Similar proteins have similar amino acid sequences. Thus, if amino acid sequences are similar, DNA of the organisms is similar (DNA transcription → RNA translation → PROTEIN).

Scientists believe that similar DNA sequences indicate a common origin. The more similar the DNA of two living organisms, the more closely related they might 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, gorillas, and horses.

In this investigation, you will:

- a. Count and record the molecules of each amino acid present in similar portions of human, 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:

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

Table I. Number of amino acid sequence differences.

Organism	Number of Differences
Gorilla and Human	
Horse and Human	
Gorilla and Horse	