

Name: _____

Date: _____ Period: _____

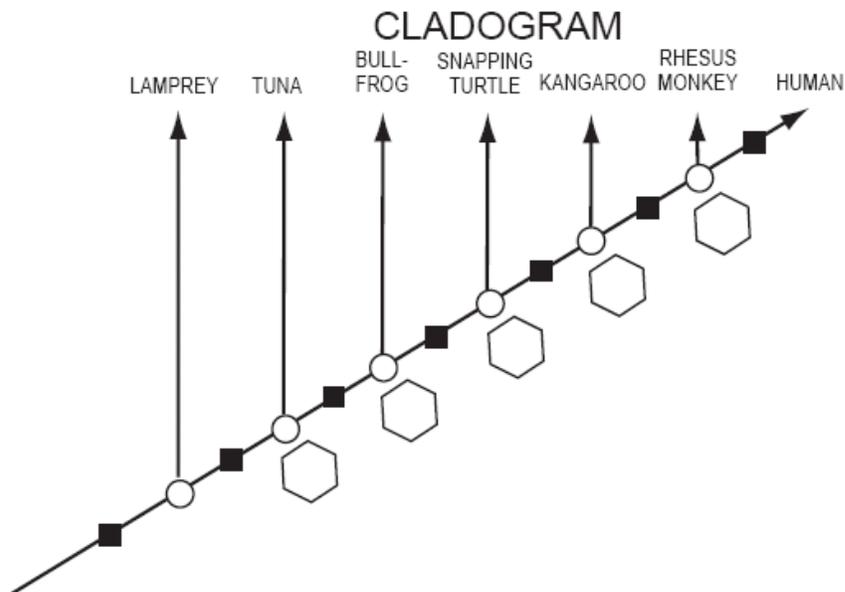
Cladograms and Genetics

1. Find the human, rhesus monkey, kangaroo, snapping turtle, bullfrog, and tuna on the "Amino Acid Sequences in Cytochrome-C Proteins from 20 Different Species" chart provided. Highlight their entire protein sequences.
2. Compare the human amino acid sequence with each of these five animals. Do this by counting the number of times an amino acid in that animal's protein is different from the same amino acid position of the human sequence. Write that information in the table below.

Number of amino acid differences between human and ...

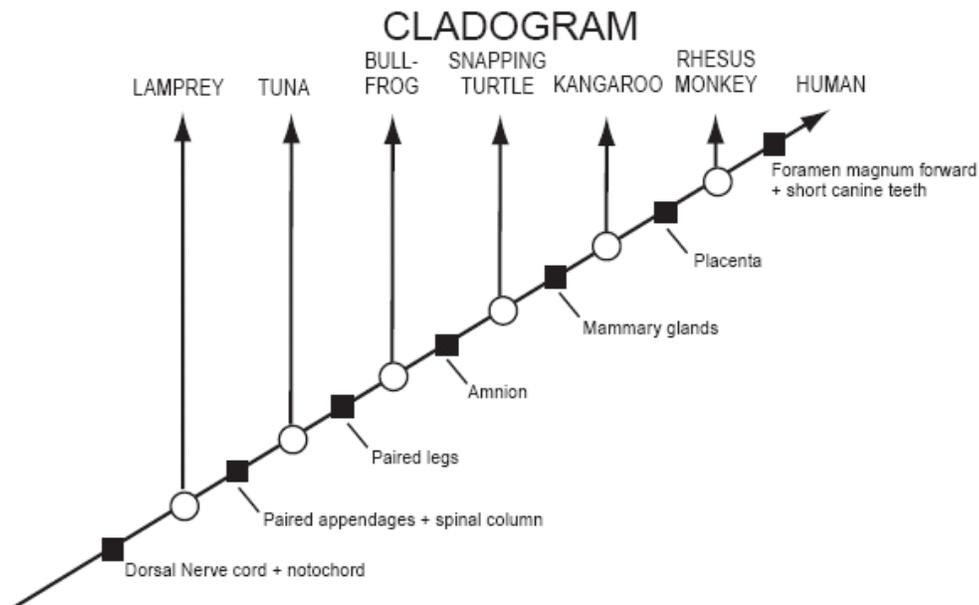
Rhesus Monkey	
Kangaroo	
Snapping Turtle	
Bull Frog	
Tuna Fish	

3. Record the total number of amino acid differences between humans and each animal shown on the cladogram on the next page. Write your answer in the hexagon below the arrow pointing to the name of that animal.



This cladogram is organized using genetic information.

4. Are these organisms in the correct order according to the genetic information?



This cladogram is organized using anatomical (body) features.

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5. Does the cladogram organized by genetic information agree with the cladogram organized by anatomical features? Why or why not?

6. Do organisms with fewer anatomical traits in common also have fewer amino acids in common?

7. If the genetic information, the anatomical similarities, and the fossil record all support the same pattern of relationships, can we be fairly confident that the pattern is accurate? Why or why not?

8. Chickens and turkeys are both birds and have the same sequence of amino acids in their cytochrome-c protein. Explain how two species can have identical cytochrome-c and still be different species.

9. Write a short paragraph summarizing the important information that can be obtained from cladograms (not the information used to make them).

Types of Selection Review

10. Starlings produce an average of five eggs in each clutch. If there are more than five, the parents cannot adequately feed the young. If there are fewer than five, predators may destroy the entire clutch. This is an example of

- a. disruptive selection.
- b. stabilizing selection.
- c. directional selection.
- d. none of the above.

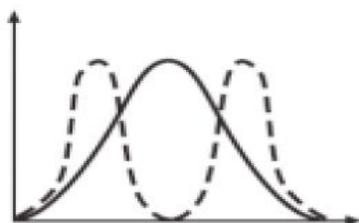
11. The occurrence of large or small beak sizes among seed crackers in the absence of medium sized beaks is an example of

- a. directional selection.
- b. stabilizing selection.
- c. disruptive selection.
- d. none of the above.

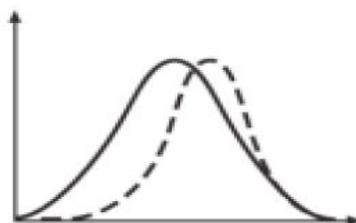
12. A scientist measures the circumference of acorns in a population of oak trees and discovers that the most common circumference is 2 cm. What would you expect the most common circumference(s) to be after 10 generations of stabilizing selection?

- a. a. 2 cm
- b. greater than 2 cm or less than 2 cm
- c. greater than 2 cm and less than 2 cm
- d. can't tell from the information given

13. Label the following graphs:



a



b



c