

MLA heading

Primate Phylogeny Lab

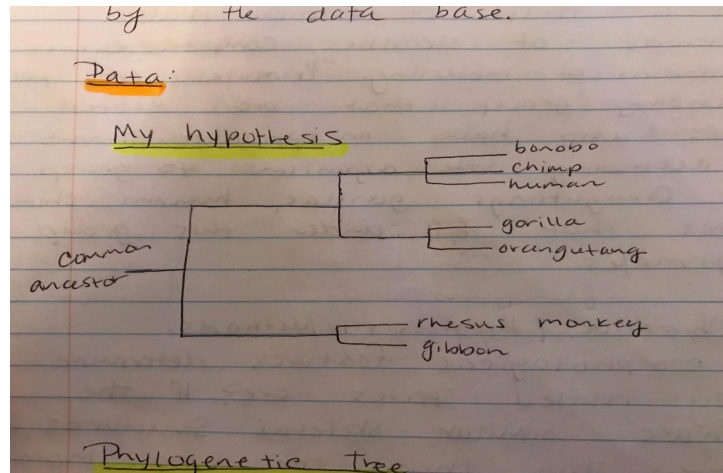
Background:

Bioinformatics analyzes biological data using certain tools. These tools can be used to sequence entire genomes, look for similarities, and can create phylogenetic trees. It is a field of science that uses methods of statistics, computer science, and mathematical modeling. Primates are part of a taxonomic group that are defined as mammals who have an opposable thumb or toe, allowing the organisms to grasp objects. Orangutans, gorillas, humans, chimps, are species that fall under this group called primates.

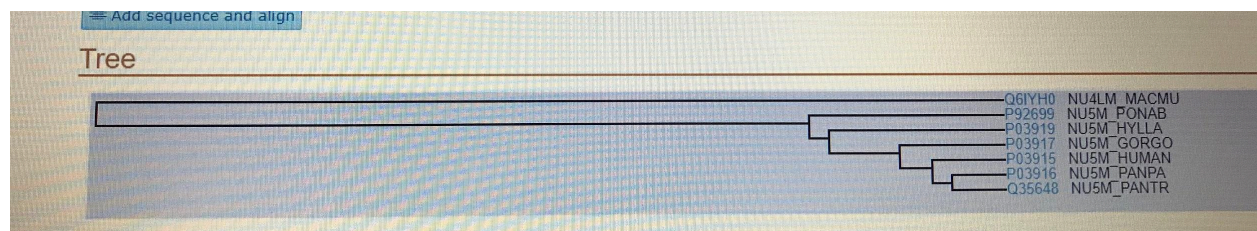
Pre Lab:

Can geographic location determine how closely related species are? If the primates live in similar locations, then they are more closely related because they are most likely to share similarities within their DNA sequence since they live within the same areas. In order to test your hypothesis, bioinformatics must be involved. Begin by creating a phylogenetic tree for the primates presented by the slide. Use the slide that compares the geographic location of the different primates to create a phylogenetic tree. This tree is will be used to create a hypothesis on how closely related each species is to one another. Using a protein sequence online database, create the actual phylogenetic tree of the primates. Record and compare how closely related each species is to another based on the information given by the data base.

Our phylogenetic tree(location):



Phylogenetic tree:



Data:

bonobo	4.14%					
chimpanzee	4.14%	95.03%				
orangutan	4.56%	84.25%	83.91%			
gorilla	3.80%	90.88%	90.71%	82.26%		
human	4.31%	93.20%	93.37%	84.25%	90.05%	
gibbon	4.98%	84.91%	84.58%	81.43%	83.58%	84.58%
	rhesus	bonobo	chimp	orangutan	gorilla	human

Analysis:

The relationship between primates is best indicated by where they live. The bonobo and chimpanzee share 95.03% of their DNA. The bonobo and gorilla share 90.88% of their DNA. The chimpanzee and gorilla share 90.71% of their DNA. These are some of the closest related primates and they all lived together or near each other at some point in mid region of Africa. The rhesus monkey shares no more than 5% of its DNA with any other primate. The rhesus monkey is also isolated from all of the other primates which explains why the rhesus monkey shares the least amount of DNA with the other primates.

Discussion:

The data from the lab supports the hypothesis showing that the relationship between primates can be determined by where they live. A problem we had with the lab was trying to figure out where to start. There was a lot of instructions and some were hard to understand, also the lab was meant to be done in class so we also couldn't ask the teacher for help. This problem, however, did not lead to inconclusive results and did not prevent us from completing the lab. The data is not incorrect because we understood how to input the species into. We overcame this problem by following the instructions the best we could and going through the websites on the links and figuring out how to plug in the data. To prevent this problem next time we could email our teacher questions on anything that we're unclear on and ask for help. A revised question based on the lab could be: "Can DNA similarities in primates be shown by where they live?". Another hypothesis that the data would support is: "If primates share a large amount of similarities in

their DNA, then they must live together or near each other because the primates being near each other allows for gene flow between the populations”.