

Student Name: _____ Period: _____

BLAST¹

Objective: Find the percent identity between DNA sequences for different animals.

1. Go to <http://www.ncbi.nlm.nih.gov/gene>
2. Enter the name of one protein, followed by the name of the organism that you are choosing for comparison. Here are the proteins you can choose for each animal

Dolphin (<i>Tursiops truncatus</i>) Cow (<i>Bos taurus</i>) Whale Shark (<i>Rhincodon typus</i>)	Bat (Large flying fox) Rat (<i>Rattus norvegicus</i>) Owl (<i>Tyto alba</i>)	Manatee (<i>Trichechus manatus</i>) Elephant (<i>Loxodonta africana</i>) Whale Shark (<i>Rhincodon typus</i>)
<ul style="list-style-type: none">● Actin Alpha 1● Cytochrome b	<ul style="list-style-type: none">● Actin Alpha 1● Rhodopsin● Cadherin 2	<ul style="list-style-type: none">● Actin Alpha 1● Cytochrome b

For example, you can write: "Actin alpha 1 cow", to find the DNA sequence of cow insulin.

3. Find and click on the information for the gene that you want. If the page gives you more than one option, select the option that most closely resembles what you are looking for, and click on it. The link will send you to a page with information only about that specific protein.
4. Scroll down to the bottom of the page and search for the FASTA link. You will need to scroll down a lot. (You can use control-F to find the word "FASTA")
5. Click on the word "FASTA". You will go to a page that has the DNA sequence for that protein. Admire it.
6. On the right-hand side, you will see an option that says, "Run BLAST". BLAST is a database to compare DNA sequences of different organisms. Click on Run BLAST. You will go to a different page.
7. On the box that says "Organism", write down the name of the organism that you would like to compare to.
8. Make sure the Database section is checked to "others"
9. Click on the "Blast" button at the bottom of the page
10. Look through the list of results and note down what is the result for "Identity". That gives you the percentage of similarity between the DNA sequences for these two animals. Record your result on a data table. Now go back and compare the original dna sequence to the other animal.

¹ The GENE and BLAST websites are provided by the National Library of Medicine. We are grateful to them for this public resource.

After you finish with these proteins, here are some more proteins you can search. Be patient because not all of these genes may have been sequenced for all the animals:

- Hemoglobin alpha 1
- Insulin
- Myosin
- Dystrophin
- Collagen
- Thrombin
- Cadherin
- Rhodopsin
- Histones
- Alcohol dehydrogenase
- Cytochrome P450 Oxydase
- Tyrosinase
- Catalase