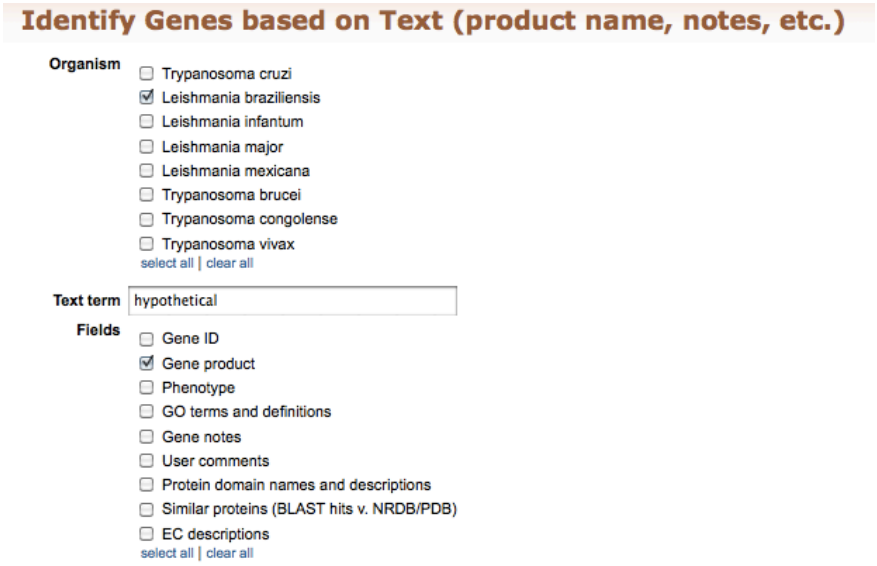
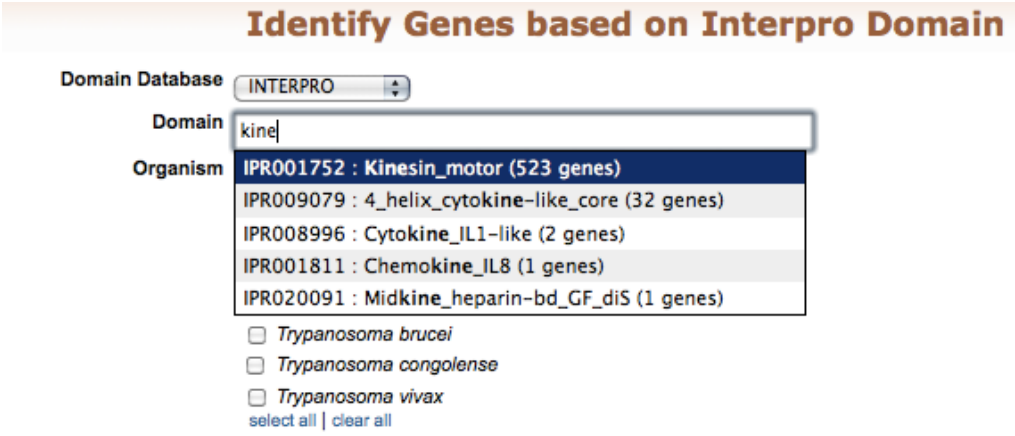
Motif Searches and Regular Expressions
(Exercise 5)

5.1 Using InterPro domain searches to identify unannotated kinesin motor proteins.

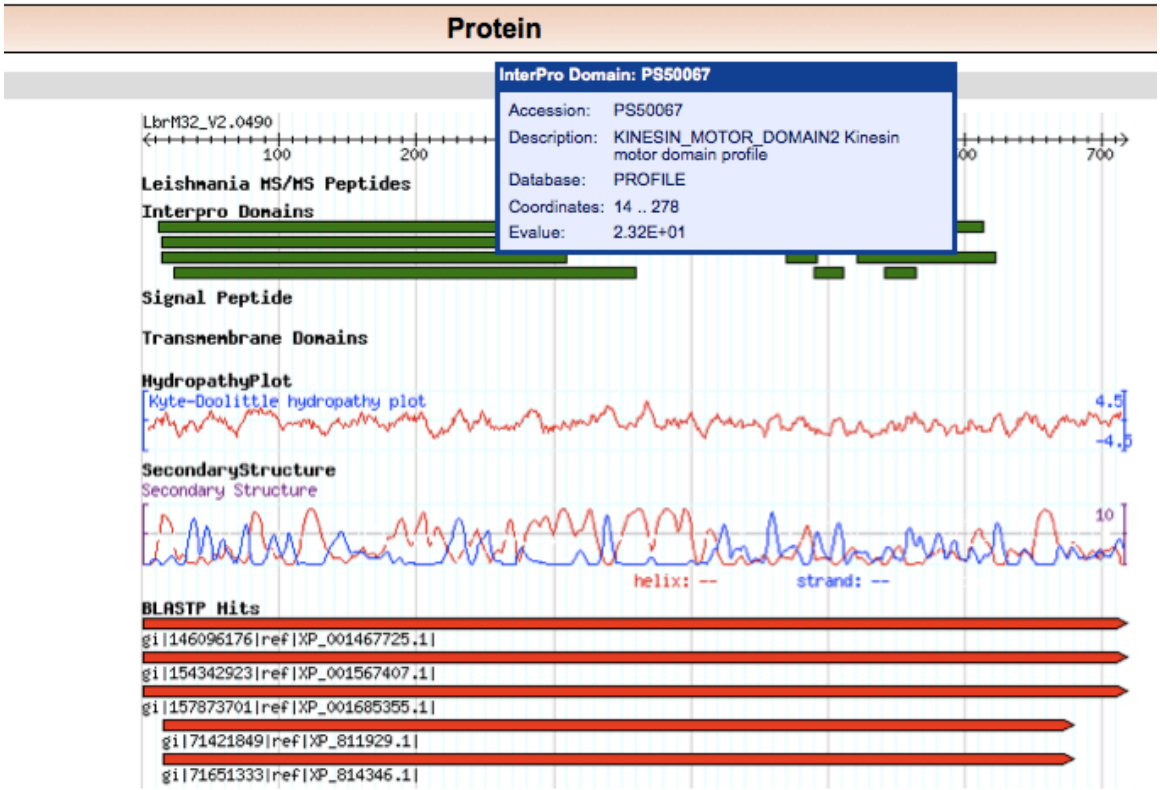
a. Identify all genes annotated as hypothetical in *L. braziliensis.* (hint: use the full text search, and look for genes with the word "hypothetical" in their product names).



b. How many of these hypothetical genes have a kinesin-motor protein InterPro domain? Add and interpro domain step -- (hint: go to the interpro domain search under similarity/pattern, start typing the work kinesin, it should autocomplete).



c. Go to the gene page for LbrM32_V2.0490 and look at the protein feature section. Does this look like a possible motor protein?



5.2 Using regular expressions to find motifs in TriTypDB

Finding active trans-sialidases in *T. cruzi.*

a. *T. cruzi* has an expanded family of trans-sialidases. In fact, if you run a text search for any gene with the word "trans-sialidase", you return over 1400 genes!!! Try this and see what you get.

b. However, not all of these are predicted to be active. It is known that active trans-sialidases have a signature tyrosine (Y) at position 342 in their amino acid sequence. Add a motif search step to the text search in 'a' to identify only the active trans-sialidases.
(hint: for your regular expression, remember that you want the first amino acid to be a methionine, followed by 340 of any amino acid, followed by a tyrosine 'Y') – refer to regular expression handout.

If you need help, you can go to this sample strategy below to see the answer:

http://tritrypdb.org/tritrypdb/im.do?s=a905e36f634f7b42