Math 6390 – Bioinformatics
Homework 2
March 5, 2002
Due March 19, 2002

The goal of this assignment is to become familiar with some of the tools commonly used for bioinformatics that are available on the web and perform tasks with them.

Perform the following tasks and write up brief descriptions of what you found. I do not want the printouts.

1. Find the nucleotide sequence for the human L-type calcium channel $\alpha 1$ subunit gene. (http://www.ncbi.nlm.nih.gov/entrez/) Save this to the clipboard for future use.
2. Use the Blast Genome tool to find upon which chromosome this is located. (http://www.ncbi.nlm.nih.gov/BLAST/)
3. Use the nucleotide-nucleotide search tool to compare this gene with any found in the human genome. You can simply cut and paste the sequence into BLAST. What did you find? What did you expect to find.
4. Search the mouse and yeast genomes for the gene from part 1. What do you find? Was this what you expected?
5. Find the mRNA sequences for human RyR1 and RyR2. These are the skeletal and cardiac isoforms for the ryanodine receptors, respectively. These are proteins that form channels that release calcium from internal stores via a "gated pore" when calcium binds to the protein. Save to the clipboard.
6. Compare human RyR1 and RyR2 using the BLAST 2 sequence comparison tool. Are there any similarities? Is this what you expected? Can you speculate as to what the function of the conserved sequences might be?