**Homework Assignment Number 3**

1. **Please choose a gene or protein of interest to you from the human genome and give its GeneID as a link to its Entrez entry like this:**

[**http://www.ncbi.nlm.nih.gov/gene/5111**](http://www.ncbi.nlm.nih.gov/gene/5111)

**Briefly discuss what the protein does and why you chose it.**

1. **How many homologous genes/proteins are known in other organisms. Use both homologene and ENSEMBL databases. Describe the results in both databases, how they differ. Mention how common you think your genes or proteins are and what taxonomic groups have them (just bacteria, just vertebrates etc.)**
2. **How many transcripts and how many alternative splice forms are known for this gene/protein? Are any of the alternative spliced forms expressed? Do they have alternative functions? Again look at both data from Evidence database in NCBI and the Transcripts from ENSEMBL. How do the number of alternatively spliced differ between the two databases and which do you feel is more accurate and why.**
3. **How many proteins does your gene product interact with? Is there a pattern of interactions? Discuss interesting or unusual interactions. You will find interacting proteins in both the NCBI Gene database and in UniProt database. Compare the two tables with each other. Are there interacting proteins unique to each?**
4. **Briefly discuss which cellular component your protein is a part of, which biological process(es) does it particpate in and which molecular function does it mediate if any? You will find the relevant gene ontology terms in both NCBI Gene and in the UniProt database.**
5. **Briefly discuss which specific structures or pathways does your gene/protein participate in?**
6. **Please send summaries of your results and your conclusions and discussions to** [**he.jk@sustc.edu.cn**](mailto:he.jk@sustc.edu.cn)**. Please include sufficient output from your analyses (copy and paste or screen dumps) to support each of your answers/conclusions. It is the conclusions that are the most important. Short answers are not appropriate. Please respond with full sentences and paragraphs on each topic above.**