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Project Guidelines

Sarah O'Leary-Driscoll
Illinois Mathematics and Science Academy, soleary@imsa.edu

Bioinformatics Research Project

For the capstone project for this course, you will be deciding on a subject area that you are interested in, and use what we've discussed in terms of techniques and programs over the course of the semester to answer a question of your choosing. Some options include:

- Doing an investigation of an individual gene/protein or protein family that is relevant or important for development or disease
- Doing a comparison of genes/proteins for the purpose of evolutionary understanding or disease comparisons (healthy vs. unhealthy)
- Using a specific gene/protein that is well understood in order to investigate/compare/ connect different programs or tools
- A combination of the above or some other novel question or project idea

Some requirements:

- Literature support: put your investigation in context. What is known about the gene(s) or protein(s) you are focusing on or the programs you plan to investigate? Why is your question important?
- Must connect knowledge of the gene(s)/protein(s) to experimental techniques
- Must involve an analysis of the characteristics specific gene(s) ORF's, regulatory regions, etc. (connection to sequencing would be helpful)
- Must involve some sort of analysis of expression (resources available on Moodle, can come from a combination or experimental and bioinformatics techniques)
- Must include sequence alignments of both DNA and protein
- Analysis of protein structure (any known structures, information to gain from it; use NCBI & PDB)
- Must include some sort of modeling analysis of protein(s)

Format:

We are going to format your research similarly to an MSI/SIR type research project. You'll be writing up a research paper that includes your contextual information, an extensive materials and methods section, and results and interpretation of what you have found, as well as a presentation (possibly a poster and/or PowerPoint, TBD)

- Be sure to capture screen shots and any other representations of the outputs of the programs you are using to be included. These will be included in an appendix to your paper

- Your introduction may not fit the typical format, as this is where you can add information like the experimental techniques that others used to provide the information you are using as background.

- You must cite and include a works cited. This includes the programs that you used (cite in your materials and methods section)