MCDB 187

Bioinformatics Lab

What we will do

- Annotate the genome of marmot which has been recently sequenced
- Each student will be given a contig and gene identifiers
- Using the DNASubway tools, they will predict the gene structure
- Proteins encoded in these genes will be analyzed using phylogenetic approaches
- You will infer the function of these genes

Topics We Will Cover in Lectures

- Genome sequencing and assembly
- Sequence alignment
- Phylogenetic techniques for building trees
- Analysis of protein function

Schedule

- Week 1 (April 4,6) - Overview, Guest lecture on the marmot genome
- Week 2 (April 11, 13) - Genome assembly and annotation
- Week 3 (April 18, 20) - Student presentations
- Week 4 (April 25, 27) - Authorship skills, BLAST

Schedule

- Week 5 (May 2,4) - Pairwise and multiple sequence alignment
- Week 6 (May 9, 11) - Cell localization, Gene Ontology
- Week 7 (May 16, 18) - Student midterm presentations
- Week 8 (May 23, 25) - Phylogenetic trees, Co-evolution

Schedule

- Week 9 (May 30, June 1) - Homology modeling
- Week 10 (June 6, 8) - Final student presentations

Computer Labs

- We have two computer lab sessions per week
- Students will use DNASubway to process sequence data
- Additional tools will be presented and used as needed
- Labs are held in YH4335

Report

- Each student is expected to write a report on the genes they have annotated
- The report should follow standard scientific publishing formats including: Title, Abstract, Background, Results with figures, Discussion, Methods, References
- Portions of the report will be due during the quarter
- The final report will be due during finals week

Schedule for Report

- Week 3 - Background and Introduction
- Week 4 - Methods
- Week 6 - Abstract
- Week 8 - Results
- Week 10 - Conclusions
- Report due at end of finals week (June 16)

Student Presentations

- Each Student will be expected to make three roughly 5 minute presentations during the quarter in the 3rd, 7th and 10th weeks
- The first will present an introduction to the genes and methods
- The second will be a progress report
- The last will be the final presentation

Grading

- Three presentations (45%)
- Final report (55%)

Web Site

- Lectures will be posted on web site
- http://pellegrini.mcdb.ucla.edu
- I will be available after class for questions
- My email - matteope@gmail.com
- TA Brian Nadel - brian.Nadel@gmail.com