BIMM 171B   Genomics Research Initiative   Spring2014

Dr. Mandy Butler   Office hours: Fridays at 1 PM
mabutler@ucsd.edu   York 3080 D   .

Lecture and lab : Wed-Fri   2 to 5 PM   York 1310

Learning goals and objectives:

• Each student will learn to use the bioinformatics tools necessary to finish and annotate bacteriophage genomes.

• Each student will complete annotation of specific segments of the bacteriophage genome isolated in BIMM 171A and maintain documentation of their annotations.

• Each student will be able to explain and justify their annotations to their classmates and, as a group, and reach consensus on the final annotations of the complete bacteriophage genome.

• The class as a whole will prepare annotated bacteriophage genomes for submission to GenBank.

• The class as a whole will assist in preparation of a poster for presentation at the UCSD Research Showcase and the SEA symposium.

Grading:

Annotation	30
Homeworks (6 worth 5% each)	30
Quizzes	20
Posters	20
Total	**100**

Annotation:
You will use keep an "annotation binder" on your computer and on Google docs in which you will document the best versions of various program outputs, including:
   1. Coding potential map from GeneMark
   2. Original annotation from DNA Master
   3. Changes to the auto annotation, along with your justification of the changes
   4. tRNA scans
   5. Frameshift Finder
   6. Other output, as specified in class

Tentative schedule:

	Lecture	Lab activities
W Apr 2	Overview of class Introduction to genes and genomes, transcription and translation	Install software Set up DNA master preferences Follow pp.4-13 in DNA Master Annotation Guide
F Apr 4	More on transcription and operons; translation and reading frames: Introduction to BLAST	BLAST the Weiss genome Map coding potential Follow pages 15-19 and 43-48 in Annotation Guide *Translation exercise*
W Apr 9	Intro to DNA Master	Work on genes 1 to 5 as a class Follow pages 21-42 in Annotation Guide
F Apr 11	Sequencing methods	Work on genes 6 to 10 Follow pages 31-42 and 59-73 in Annotation guide *Homework Assignment on genes 6 to 10 due next lab*
W Apr 16	Phage genes and genome organization	Assign genes and start annotation in groups Follow pages 73 – 90 and 97-98 in Annotation guide Start keeping annotation documentation
F Apr 18	Phage genes cont	*Quiz 1* Work on annotation Do tScan pages 90-97 in Annotation guide *Assign Mycobacteriophage L5 paper*
W Apr 23	Discuss in class Mycobacteriophage L5 genome paper	Work on annotation
F April 25	Introduction to Phamerator Review annotations	Use Phamerator and Blast to begin assigning gene functions Follow pages 49-57 and 99-107 in Annotation Guide *Gene function homework*
W Apr 30	Comparison of Weiss genome to related phage	Continue functional annotation *Assign Hatfull 2010 review*
W May 2	An introduction to proteomics: Can we use proteomic data to identify phage genes?	Use proteomics data to support annotation *Discuss Hatfull paper*
W May 7	Or proteomics here?	Use proteomics data to support annotation *Proteomics homework*
F May 9	Discussion: Does the proteomic data support our annotation	*Assign Joe's paper*
W May 14	Joe's lecture	Polish annotation
F May 16	Stoperators, repeat sequences, MPMEs etc	*Quiz 2* Merge files pp.109-116 *Assign Phage cluster paper by Pope 2011* Sun god?

W May 21	How to make a poster Discuss Phage cluster paper by Pope	Discuss topics for poster and form teams
F May 23	Start posters	
W May 28	Continue posters	
F May 30	Practice presenting posters in class	Finish Poster (must be finished by end of class)
W June 4	Research showcase set up	Starts at 4 PM
F June 6		

Info on Research showcase
http://www.biology.ucsd.edu/education/undergrad/research/showcase/