

BENG 183: Applied Genomic Technologies

Fall Quarter, 2012

Instructor: Trey Ideker

TA: Gabriel Pratt

Grading:

10 Attendance

30 Midterm exam

30 Final group project

30 Problem sets

100 Total

Course Description

183. Applied Genomic Technologies (4) Principles and technologies for using genomic information for biomedical applications. Technologies will be introduced progressively, from DNA to RNA to protein to whole cell systems. The integration of biology, chemistry, engineering, and computation will be stressed. Topics include: Technology for the Genome, DNA Chips, RNA Technologies, Proteomic Technologies, Physiomic and Phenomic Technologies, Analysis of Cell Function. *Prerequisite: grade of C- or better in B1MM 100 or Chem 114C; B1CD 110; Bioinformatics majors only.* (F)

Textbooks

Required: *Introduction to Genomics*, Arthur Lesk, Oxford University Press

Supplemental: *Discovering Genomics, Proteomics, and Bioinformatics* by A. Malcolm Campbell, Laurie J. Heyer Cold Spring Harbor Press

Supplemental: *Principles of Genome Analysis and Genomics* Sandy B. Primrose, S. B. Primrose, Richard M. Twyman; Blackwell publishing

Wk	Num	Date	Theme	Topics covered
0	1	9/27/2012	Introduction	Introduction: The revolution of genomics
1	2	10/2/2012	Genome structure	Genome size and complexity, CoT curve analysis
	3	10/4/2012	Genome structure	Exons/Introns, Repeats
2	4	10/9/2012	Gene association	GWAS and linkage mapping I
	5	10/11/2012	FIELD TRIP	Tour of the BioGEM Genomics Core on UCSD campus
3	6	10/16/2012	Gene association	GWAS and linkage mapping II
	7	10/18/2012	DNA sequencing	Sanger sequencing reaction, automated sequencing, sequencing by hybridization, DNA synthesis
4	8	10/23/2012	DNA sequencing	Next generation methods based on adapter sequencing, pyrosequencing
	9	10/25/2012	DNA sequencing	Technologies for genotyping
5	10	10/30/2012	mRNA expression	Expression Technologies: Microarrays
	11	11/1/2012	mRNA expression	Expression Technologies: cDNA / EST Sequencing Projects
6	12	11/6/2012	Proteomics	Protein sequencing by Edman degradation and mass spec
	13	11/8/2012	Proteomics	Protein Expression
7	14	11/13/2012	Proteomics	Protein Tagging and Localization
	15	11/15/2012	MIDTERM	ALL PREVIOUSLY COVERED MATERIAL
8	16	11/20/2012	Phenotyping	Comprehensive Mutant Libraries
	17	11/22/2012	Phenotyping	Comprehensive Mutant Libraries II
9	18	11/27/2012	Interactions	Protein Interactions
	-	11/29/2012	THANKSGIVING	
10	19	12/4/2012	PRESENTATIONS	
	20	12/6/2012	PRESENTATIONS	

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PAPERS DUE