BIOLOGICAL SCIENCES 431
MOLECULAR BIOTECHNOLOGY
96-1

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PREREQUISITES: BISC 331 (or the old BISC 321), or permission of instructor. Enrollment is limited to 40, and may have to be limited.

DESCRIPTION:
The lectures will cover recombinant DNA methods, around a framework such as:
- Prepare foreign DNA
- Prepare vector
- Join the two --> recombinant DNA molecule
- Introduce recDNA into host
- Select host and desired recDNA
- Propagate recDNA in host, isolate DNA
- Bypassing libraries: PCR
- Characterize DNA, Expression, Mutagenesis.
- Other- special topics

The aim of the lectures is to give some details in the first 2-3 weeks, to "flesh out" the above outline, and to give some information necessary to understand the methods used in the lab (some of this should be familiar from BISC 331). We'll then go over the outline again, but in the kind of detail necessary to read the literature, and follow parallel demonstrations of the experiments we'll be doing. Lab exercises will involve one full afternoon per week, plus additional open lab time before and/or after to setup and analyze results. In addition to lecture material listed above, there will be extra material covered in lab handouts and talks.

Accompanying Lab Exercises:
A. Introduction: setting up a lab, safety, equipment, microbiology and sterile technique
B. Preparation and characterization of genomic DNA
C. Plasmid miniprep, restriction digestion and gel electrophoresis
D. Southern blotting
E. Screening a phage library: plaque lifts (Non-radioactive detection of positives etc.)
F. Isolation of DNA and subcloning into a plasmid
G. Polymerase Chain reaction
H. DNA sequencing, dideoxy method, using radioactivity (35S)

TEXT:
Old and Primrose, Principles of Gene Manipulation, Fifth (5th) ed. (NOT earlier), 1994; this will be supplemented by numerous other handouts and materials.

GRADING:
Grading will be based on two midterms (20% each?), short lab reports plus one complete lab writeup (probably about 20%), and a final exam (roughly 40%), exact proportions TBA.