

**CHEMISTRY 210**  
**BIOTECHNOLOGY: SCIENCE, CULTURE AND ETHICS**  
**SPRING 2000**

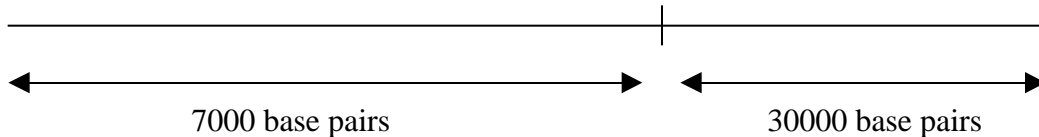
**MODULE 2 PRACTICE PROBLEMS ANSWER KEY.**

1. 5'

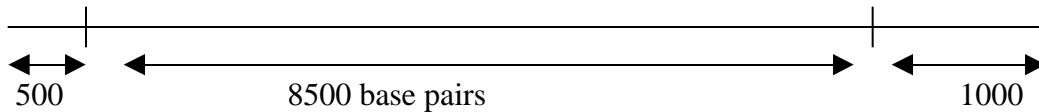
CAAAAAACGGACGGGTGTACAACCTTTTACTATGGCGTGACACCTAAATTATA  
GGCAGAAATAAGTACATGACTATTGGGAGGAGCAGGAACAAGTAGG-3'

4.

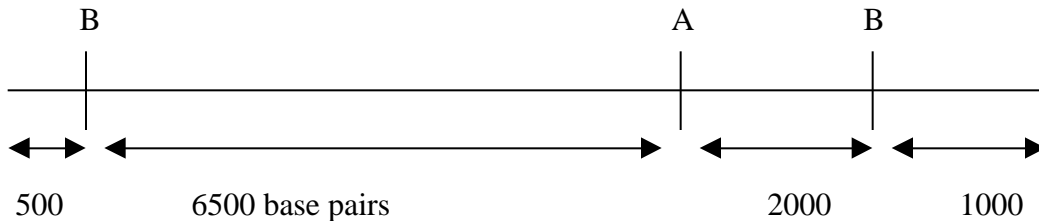
Cut with A:



Cut with B:



Cut with A and B:

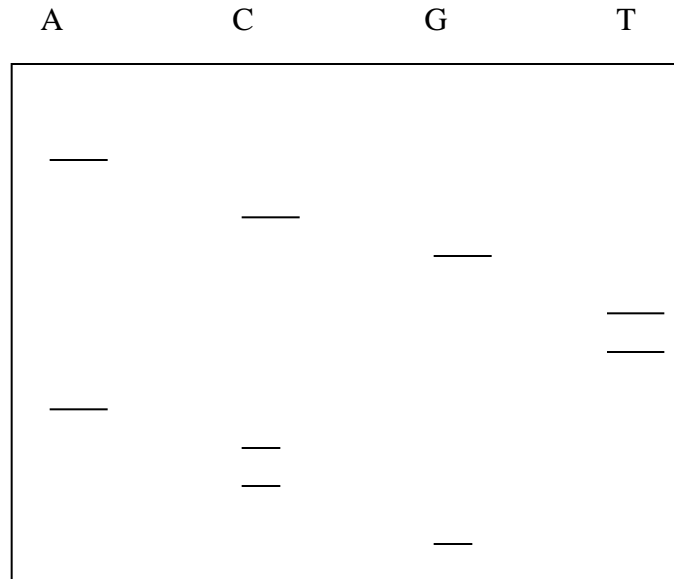


5. There is no difference between the single stranded ends generated by BamHI and by MboI. These ends are complementary, and they can anneal and be ligated together by DNA ligase. The resulting sequence contains an MboI site and can be cleaved by that enzyme. Whether or not it can be cleaved by BamHI, however, depends on the nucleotide located adjacent to the MboI site.

12. If the sickle cell mutation is present, the cleavage site for MstII will be removed, and this can be detected in the Southern blot. There may be other mutations to this site, however, which do not change the amino acid sequence but do remove the MstII cleavage site--these might give a false positive result for a sickle cell screen.

Other problems:

2.



3. The clone from genomic DNA will contain intron sequences which a prokaryote (like *E. coli*) will not be able to splice from the resulting mRNA transcript. Therefore, one should use cDNA instead--here the introns have already been removed from the sequence.