

Biology I Advanced  
Objectives Biotechnology Ch. 10, 12

1. Describe the structure of a virus.
2. Describe and differentiate between lysogenic and lytic virus life cycles.
3. Name and describe three ways that bacteria can exchange DNA in nature. Differentiate between the results of each.
4. Define these terms:

|                 |           |                    |                       |            |
|-----------------|-----------|--------------------|-----------------------|------------|
| plasmid         | R plasmid | F factor           | biotechnology         | transgenic |
| recombinant DNA |           | restriction enzyme | genetic engineering   | clone      |
| DNA ligase      |           | genomic library    | reverse transcriptase | genomics   |
| proteomics      |           |                    |                       |            |
5. Describe the action of a restriction enzyme. Include the terms *palindrome*, *recognition site*, *sticky ends*, and *cleavage site*.
6. Outline the steps of producing a recombinant plasmid. Explain how the plasmid can be used to produce a product and/or clone genes.
7. Describe several medical applications for DNA technology. Include advantages of recombinant product over traditionally produced products.
8. Describe three applications for labeled DNA probes.
9. Explain how gel electrophoresis sorts DNA fragments.
10. Explain the process of DNA fingerprinting. Include these terms in your answer: RFLP, electrophoresis, polymorphism, hypervariable
11. Describe the process of PCR. Explain how primers, Taq polymerase and thermocyclers are involved in the process. What are some applications for PCR?
12. Name several organisms that have had their genomes completely sequenced. Explain the significance of this type of research.
13. Describe several agricultural applications for biotechnology. Discuss some ethical considerations about the use of GM organisms.