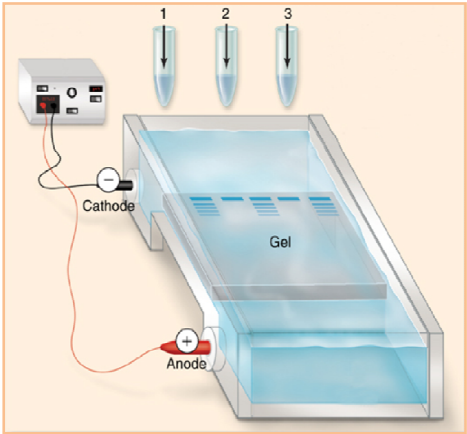


Chapter 17 – Biotechnology



1. Define **biotechnology**.

2. What is meant by “**recombinant DNA technology**?”

3. What is the function of a **restriction endonuclease**? What is meant by "**sticky ends**"? What is the role of **DNA ligase**?

4. What is the role of **gel electrophoresis**? Describe this technique.

5. DNA can be introduced into *E. coli* through the process of artificial _____ .

6. What is meant by **molecular cloning** (sometimes called **gene cloning**)?

7. What is a **vector**? What are the 2 most commonly used vectors?

8. What is the most flexible and commonly used host for molecular cloning? _____
What other organisms are now being used as hosts for molecular cloning?

9. What are **plasmids**?

10. What are **phages**?

11. Discuss the 2 essential components of any plasmid vector.

a. _____

b. _____

12. Discuss the 2 requirements of any lambda (phage) vector not shared with plasmid vectors .

a. _____

b. _____

13. Which is a larger vector? phage or plasmid? _____

14. What is a **genomic library**?

15. How is **cDNA** different from typical eukaryote DNA?

16. What can be accomplished with **molecular hybridization**? Briefly discuss this process.

17. What does the technique of **Southern Blotting** accomplish?

18. What are some other techniques that build on the Southern Blotting technique?

19. What is a **RFLP**? How are they made?

20. How has forensics made use of DNA technology? Give a specific example.

21. What is the purpose of the **Polymerase Chain Reaction**? List some advantages and uses of the PCR technique.

22. Discuss the 3 basic steps of the PCR procedure.

a. _____

b. _____

c. _____

23. What is meant by a **transgenic animal**?

24. **In vitro mutagenesis** has become very important in research today. What is it? Why is it being used?

25. What are **knockout mice**? Explain how their use is an example of **reverse genetics**.

26. Why are bacteria ideal workhorses for biotechnology?

27. Name some human proteins currently being produced in bacteria.

28. Describe the 2 types of genetically engineered vaccines currently under investigation.

a. **Subunit vaccines**

b. **DNA vaccines**

29. What is **gene therapy**? Why has it been controversial? Name a few diseases being treated in clinical trials of gene therapy.

30. What technique has been used to modify agricultural plants?

31. List a few of the traits that have been engineered into agricultural plants? Why are some people concerned?

34. What is **biopharming**? What are the ethical issues associated with this technology?

35. What was the 1st human protein to be produced in plants?

36. What is an advantage to using plants for vaccine production?

36. What has been the main use so far of transgenic animal technology in biopharming?
