

Microbiology / Active Lecture Questions
Chapter 9 – Biotechnology & Recombinant DNA

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2 Restriction enzymes were first discovered with the observation that

- a. DNA is restricted to the nucleus.
- b. phage DNA is destroyed in a host cell.
- c. foreign DNA is kept out of a cell.
- d. foreign DNA is restricted to the cytoplasm.
- e. all of the above

3 What are restriction enzymes?

- a. Animal enzymes that connect RNA pieces
- b. Viral enzymes that destroy host DNA
- c. Bacterial enzymes that connects DNA
- d. Bacterial enzymes that destroy phage DNA

4 The DNA probe, 3'-GGCTTA, will hybridize with which of the following?

- a. 5'-CCGUUA
- b. 5'-CCGAAT
- c. 5'-GGCTTA
- d. 3'-CCGAAT
- e. 3'-GGCAAU

5 Which of the following is the fourth basic step to genetically modify a cell?

- a. transformation
- b. ligation
- c. plasmid cleavage
- d. restriction-enzyme digestion of gene
- e. isolation of gene

6 The following enzymes are used to make cDNA. What is the second enzyme used to make cDNA?

- a. reverse transcriptase
- b. ribozyme
- c. RNA polymerase
- d. DNA polymerase

7 If you put a gene in a virus, the next step in genetic modification would be

- a. insertion of a plasmid.
- b. transformation.
- c. transduction.
- d. PCR.
- e. Southern blotting.

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8 You have a small gene that you want replicated by PCR. You add radioactively labeled nucleotides to the PCR thermalcycler. After three replication cycles, what percentage of the DNA single-strands are radioactively labeled?

- a. 0%
- b. 12.5%
- c. 50%
- d. 87.5%
- e. 100%

9 Pieces of human DNA stored in yeast cells.

- a. antisense
- b. clone
- c. library
- d. Southern blot
- e. vector

10 A population of cells carrying a desired plasmid.

- a. antisense
- b. clone
- c. library
- d. Southern blot
- e. vector

11 Self-replicating DNA for transmitting a gene from one organism to another.

- a. antisense
- b. clone
- c. library
- d. Southern blot
- e. vector

12 A gene that hybridizes with mRNA.

- a. antisense
- b. clone
- c. library
- d. Southern blot
- e. vector

13 Today, chemicals that organisms don't naturally make are made by microorganisms and

- a. Plants
- b. Fungi
- c. Protozoa
- d. Helminths

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14 The term that refers to pieces of DNA stored in yeast cells is

- a. Vector
- b. Library
- c. Southern blot
- d. PCR

15 The procedure during which cells can take up DNA from the surrounding environment is called

- a. Electroporation
- b. Protoplast fusion
- c. Transformation
- d. Microinjection

16 What do humans use to obtain desirable breeds of animals or strains of plants to cultivate?

- a. Natural selection
- b. Artificial selection
- c. Restriction enzymes
- d. PCR

17 Which of the following techniques is used to locate a gene within a cell?

- a. Cloning
- b. Southern blot
- c. Transformation
- d. PCR

18 Which of the following methods is especially valuable in the genetic manipulation of plant and algal cells?

- a. Protoplast fusion
- b. Viral transduction
- c. Transformation
- d. Cloning

19 The production of human insulin is an example of gene therapy. This is accomplished by

- a. Inserting the insulin gene in E. coli
- b. Injecting insulin into a diabetic person
- c. Inserting the insulin gene in a diabetic person's pancreatic cells
- d. Injecting insulin in a mammalian cell culture

20 A restriction fragment is

- a. A codon
- b. A gene
- c. A segment of DNA
- d. A segment of RNA

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21 Which of the following processes is NOT involved in the production of cDNA?

- a. Transcription
- b. Translation
- c. Reverse transcription
- d. RNA processing to remove introns

22 In plants, the Ti plasmid can cause

- a. Crown gall disease
- b. Tobacco mosaic disease
- c. Pseudomonas
- d. Soft rot disease

23 The use of an antibiotic resistance gene on a plasmid used in genetic engineering makes

- a. Direct selection possible
- b. The recombinant cell dangerous
- c. Replica plating possible
- d. The recombinant cell unable to survive

24 Which bacterium has been genetically modified to produce a human protein, gamma interferon?

- a. *Bacillus thuringiensis*
- b. *Staphylococcus aureus*
- c. *E. coli*
- d. *Pseudomonas fluorescens*

25 Where does the Ti plasmid naturally occur?

- a. In *Thermus aquaticus*
- b. In *Saccharomyces cerevisiae*
- c. In *Bacillus thuringiensis*
- d. In *Agrobacterium tumefaciens*

26 One of the earliest commercial products of rDNA technology was

- a. Rennin
- b. Cellulase
- c. Malaria vaccine
- d. Human growth hormone

27 If you have inserted a gene in the Ti plasmid, the next step in genetic engineering is

- a. Inserting the Ti plasmid into *Agrobacterium*
- b. Transformation of an animal cell
- c. Transformation of *E. coli* with Ti
- d. Splicing Ti into a plasmid

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28 Know the southern blot technique.

29 Why does Ecoli make human insulin?

- a. Because it needs it
- b. A human gene was inserted into it
- c. Nature intended it that way
- d. It picked up the insulin gene from another cell