

## 15.2 Recombinant DNA

### Copying DNA

For Questions 1–5, complete each statement by writing in the correct word or words.

1. Genetic engineers can transfer \_\_\_\_\_ from one organism to another.
2. As a first step toward finding a gene, Douglas Prasher studied the \_\_\_\_\_ sequence of part of a protein.
3. Prasher next found the \_\_\_\_\_ base sequence that coded for the protein.
4. Using the technique of \_\_\_\_\_, Prasher matched the mRNA to a DNA fragment that contained the gene for GFP.
5. Southern blot analysis uses \_\_\_\_\_ probes to bind to fragments with complementary base sequences.

### Changing DNA

For Questions 7–10, write the letter of the correct answer on the line at the left.

- \_\_\_\_\_ 7. Why is DNA ligase so important in recombinant DNA technology?
- A. It causes DNA to make multiple copies of itself.
  - B. It joins two DNA fragments together.
  - C. It shapes bacterial DNA into a circular plasmid.
  - D. It cuts DNA into restriction fragments.
- \_\_\_\_\_ 8. A recombinant plasmid can be used to
- A. prevent nondisjunction at meiosis.
  - B. double the number of chromosomes in a plant cell.
  - C. cut DNA into restriction fragments.
  - D. transform a bacterium.
- \_\_\_\_\_ 9. What do genetic engineers use to create the “sticky ends” needed to splice two fragments of DNA together?
- A. an amino acid sequence
  - B. DNA ligase
  - C. restriction enzymes
  - D. mRNA
- \_\_\_\_\_ 10. Why must a genetically engineered plasmid contain a genetic marker?
- A. to prevent the construction of an artificial chromosome
  - B. to separate cells that contain recombinant DNA from those that do not
  - C. to produce multiple copies of the recombined plasmid after heat treatment
  - D. to break apart the circular plasmid and introduce another DNA fragment

11. Give a reason why a plasmid is useful for DNA transfer.

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13. What is a transgenic organism?

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14. What can happen when DNA is injected into the nucleus of an animal's egg cell?

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15. How is a DNA molecule constructed so that it will eliminate a particular gene?

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16. What is a clone?

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17. What kinds of mammals have been cloned in recent years?

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*For Questions 18–22, write True if the statement is true. If the statement is false, change the underlined word to make the statement true.*

- \_\_\_\_\_ 18. An organism that contains one or more genes from another species is inbred.
- \_\_\_\_\_ 19. Transgenic organisms can be made by inserting recombinant DNA into the genome of the host organism.
- \_\_\_\_\_ 20. Examining the properties of a transgenic organism allows scientists to discover the function of the transferred chromosome.
- \_\_\_\_\_ 21. Plant cells will sometimes take up DNA on their own if their cell walls are absent.
- \_\_\_\_\_ 22. Carefully designed DNA molecules can achieve gene replacement.

*On the lines below, write T next to an example of a transgenic organism, and C next to an example of a clone.*

- \_\_\_\_\_ 23. A goat that produces spider's silk in its milk
- \_\_\_\_\_ 24. A plant that is grown from a cell into which *Agrobacterium* has incorporated recombinant DNA
- \_\_\_\_\_ 25. A lamb that is born with the same DNA as a donor cell
- \_\_\_\_\_ 26. A colony of bacteria that grows from one bacterium
- \_\_\_\_\_ 27. A bacterium that can produce human insulin