Name_____ Class_____ Date _____

Section 13–3 Cell Transformation (pages 327–329)

Key Concepts

- What happens during cell transformation?
- How can you tell if a transformation experiment has been successful?

Introduction (page 327)

1. What occurs during transformation? _____

_____

2. Is the following sentence true or false? Griffith's extract of heat-killed bacteria contained DNA fragments. _____

Transforming Bacteria (pages 327–328)

3. Complete the flowchart to show the steps in transforming bacteria.

Foreign DNA is joined to a(an) _____, which is a small, circular DNA molecule found naturally in some bacteria.

↓

Recombinant plasmids are mixed with bacterial cells. Some bacterial cells take in the recombinant DNA by the process of _____.

↓

The culture is treated with a(an) _____, a compound that kills bacteria.

↓

Only cells that have been transformed survive, because only they carry a(an) _____ for antibiotic resistance.

4. Give two reasons why a plasmid is useful for DNA transfer.

a. _____

_____

b. _____

_____

Transforming Plant Cells (pages 328–329)

5. When researchers transform plant cells using a bacterium that causes plant tumors, how do researchers prevent plant tumors from forming in the transformed cells?

_____

_____

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6. Circle the letter of each sentence that is true about transforming plant cells.
   a. Many plant cells can be transformed by using a bacterium that will, in nature, insert a tumor-producing plasmid into plant cells.
   b. Sometimes plant cells in culture will take up DNA on their own when their cell walls are removed.
   c. It is impossible to inject DNA directly into plant cells.
   d. Plant cells that are transformed cannot develop into adult plants.
7. Describe what occurs in a successful transformation of cells. _____

Transforming Animal Cells (page 329)

8. Describe how animal cells can be transformed by directly injecting DNA.
9. Is the following sentence true or false? The DNA molecules used for transformation of animal cells do not require marker genes. _____
10. How is a DNA molecule constructed so that it will eliminate a particular gene?
11. Is the following sentence true or false? Gene replacement has made it possible to identify the specific functions of genes in many organisms. _____

Reading Skill Practice

When you read about related concepts, a compare-and-contrast table can help you focus on their similarities and differences. Construct a table to compare and contrast transformation in bacteria, plants, and animals. Look in Appendix A for more information about compare-and-contrast tables. Do your work on a separate sheet of paper.

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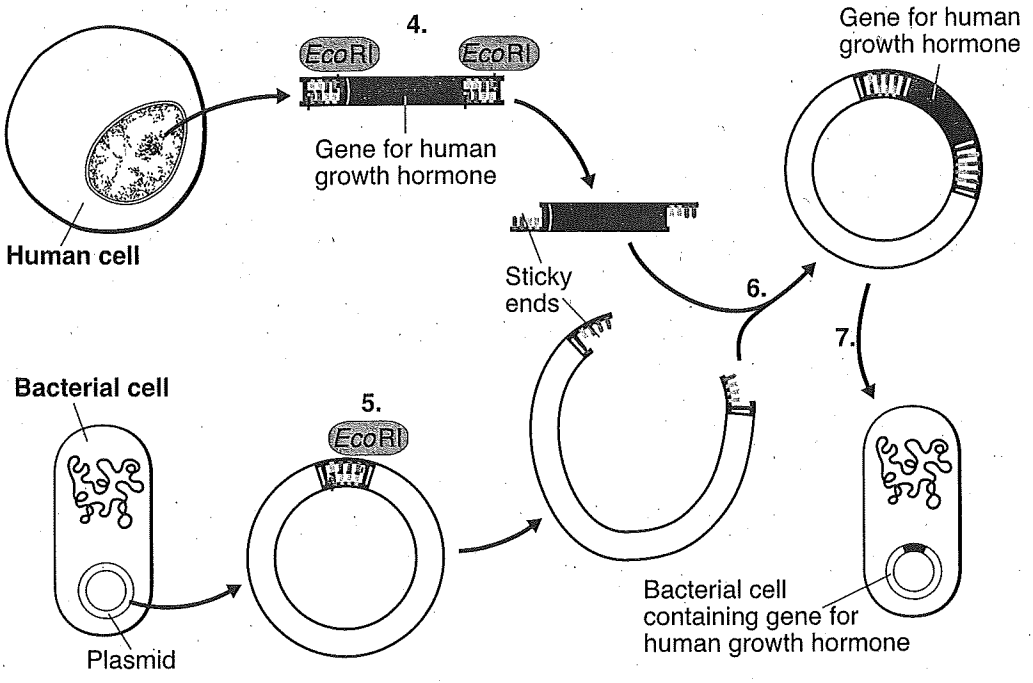
Reviewing Key Concepts

Completion *On the lines provided, complete the following sentence using three of the following words:* inside, outside, DNA, RNA, replication, transformation.

During _____ (1.), a cell takes in DNA from _____ (2.) the cell, which then becomes part of the cell's _____ (3.).

Identifying Processes *On the lines provided, describe the steps in the transformation of bacteria shown here.*



4. _____

5. _____

6. _____

7. _____

8. What happens to the recombinant DNA during a successful cell transformation?

_____

_____

Reviewing Key Skills

9. **Applying Concepts** How might a plasmid be used to alter the characteristics of an organism?

_____

_____

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