

# Ch. 13/14. Genetic Engineering & Human Molecular Genetics. Biology. Landis

Su nombre es \_\_\_\_\_

## Section 13–1 Changing the Living World (pages 319–321)

*This section explains how people use selective breeding and mutations to develop organisms with desirable characteristics.*

### Selective Breeding (pages 319–320)

1. What is meant by selective breeding?

2. Complete the compare-and-contrast table of types of selective breeding.

#### SELECTIVE BREEDING

Type	Description	Examples
	Crossing dissimilar individuals to bring together the best of both organisms	
	The continued breeding of individuals with similar characteristics	

3. What are the risks of inbreeding?

### Increasing Variation (pages 320–321)

4. Why are biologists interested in preserving the diversity of plants and animals in the wild?

5. Breeders can increase the genetic variation by inducing \_\_\_\_\_, which are the ultimate source of genetic variability.

6. Is the following sentence true or false? Mutations cannot occur spontaneously.

7. Name two methods used by breeders to increase the rate of mutation.

8. Is the following sentence true or false? Scientists have produced bacteria that can digest oil.

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### **Section 13–4 Applications of Genetic Engineering (pages 331–333)**

*This section explains how transgenic organisms are made. It also describes what a clone is and how animal clones are produced.*

#### **Transgenic Organisms (pages 331–333)**

9. What is a transgenic organism?

10. Describe how to make a transgenic organism.

11. Circle the letter of each sentence that is true about transgenic microorganisms.

- a. Transgenic bacteria will never produce useful substances for health and industry.
- b. Transgenic bacteria produce human proteins cheaply and in great abundance.
- c. People with insulin-dependent diabetes are now treated with pure human insulin.
- d. In the future, transgenic organisms may produce the raw materials for plastics.

12. List four ways in which transgenic animals have been used.

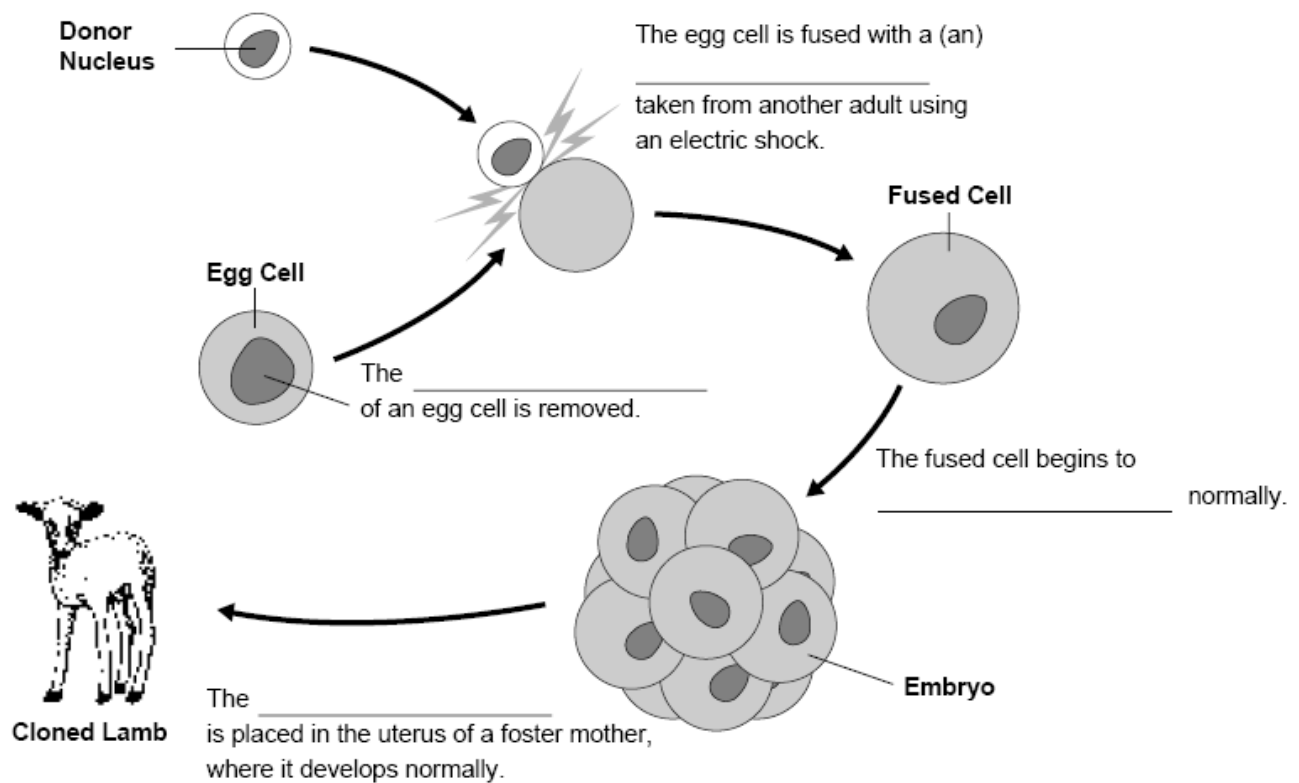
#### **Cloning (page 333)**

13. What is a clone?

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14. Complete the sentences in the diagram below to show the steps in cloning a sheep.



**Section 14–3 Human Molecular Genetics (pages 355–360)**

*This section explains how genetic engineering techniques are being used to study the genes and chromosomes in the human genome. It also describes how this information is used for gene therapy.*

**Human DNA Analysis (pages 355–357)**

15. What is DNA fingerprinting?

**Gene Therapy (pages 359–360)**

16. What is gene therapy?

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17. Circle the letter of each sentence that is true about gene therapy.

- a. When the normal copy of the gene is inserted, the body can make the correct protein, which eliminates the disorder.
- b. So far, no one has been successfully cured of a genetic disorder using gene therapy.
- c. Viruses are often used to carry the normal genes into cells.
- d. Viruses used in gene therapy often cause disease in the patients.

**Ethical Issues in Human Genetics (page 360)**

18. What other changes could be made to the human genome by manipulating human cells?

19. What is the ultimate goal of biology?

20. What is the responsibility of society in biology?