

# 15.4 Ethics and Impacts of Biotechnology

## Lesson Objectives

-  Describe some of the issues that relate to biotechnology.
-  Identify some of the pros and cons of genetically modified food.
-  Describe some of the ethical issues relating to biotechnology.

## Lesson Summary

**Profits and Privacy** Most of the research in genetic engineering is done by private companies.

- ▶ They patent their findings and inventions to protect their investment and make a profit.
- ▶ The patents block other scientists from pursuing certain lines of research.
- ▶ In 2007, the Genetic Information Nondiscrimination Act was signed into law in the United States. It prohibits discrimination based on genetic information.

**Safety of Transgenics** There is controversy about the safety of GM foods.

- ▶ Proponents of genetically modified foods argue that GM crops are better, safer, and higher yielding than conventional crops. GM crops require less land and energy to grow, and insecticides need not be applied to insect-resistant strains. Careful studies have provided no support for concerns about the safety of GM crops.
- ▶ Opponents argue that the safety of GM crops has been neither adequately tested for long-term use, nor regulated. Patents on GM seeds may force small farmers out of business. The resistance of GM plants to insects may harm beneficial insect species. Resistance to herbicides may result in the overuse of toxic chemicals.
- ▶ Some states have introduced legislation to require that GM foods be labeled.

**Ethics of the New Biology** Few argue that gene therapy for curing disease is ethically wrong, but many ask the question of how far genetic modification should go.

- ▶ Is it right to try to engineer children to have certain characteristics?
- ▶ Should human cloning be allowed?

## Profits and Privacy

1. Should you be able to keep your genetic information confidential? State two answers: one giving a reason for a “yes” answer, and the other giving a reason for a “no” answer.

Yes \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

No \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Explain what the Genetics Information Nondiscrimination Act is, and give an example of how it might protect people.

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## Safety of Transgenics

3. Complete the table to summarize the pros and cons of genetically modified foods. List at least four items in each column.

| Pros | Cons |
|------|------|
|      |      |

For Questions 4–8, write *True* if the statement is true. If the statement is false, change the underlined word or words to make the statement true.

- \_\_\_\_\_ 4. Most GM plants are grown in the United States.
- \_\_\_\_\_ 5. Growing GM crops requires more energy resources than growing traditional crops.
- \_\_\_\_\_ 6. With all the questions raised about GM agriculture, the wider use of biotechnology has been blocked.
- \_\_\_\_\_ 7. Federal laws in the U. S. require that GM foods be labeled as such.
- \_\_\_\_\_ 8. GM foods are required to undergo safety testing before they enter the U. S. market.

9. Some proponents of GM agriculture argue that GM crops are safer than others. Explain what they mean.

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10. Some critics of GM agriculture fear that GM plants' resistance to herbicides could result in the overuse of toxic chemicals. Explain why this may happen.

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## Ethics of the New Biology

11. It is easy to move genes from one species to another. Is it right to do this? Explain your position.

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### Apply the Big idea

12. Recent developments have resulted in the ability to clone cats. Many people argue that cloning offers pet owners comfort in a time of need. Others argue that there are many homeless pets at shelters in need of homes, and that adopting one of these animals is a better solution for owners who have lost a pet. Do you think that the cloning of pets is acceptable? Explain why or why not.

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