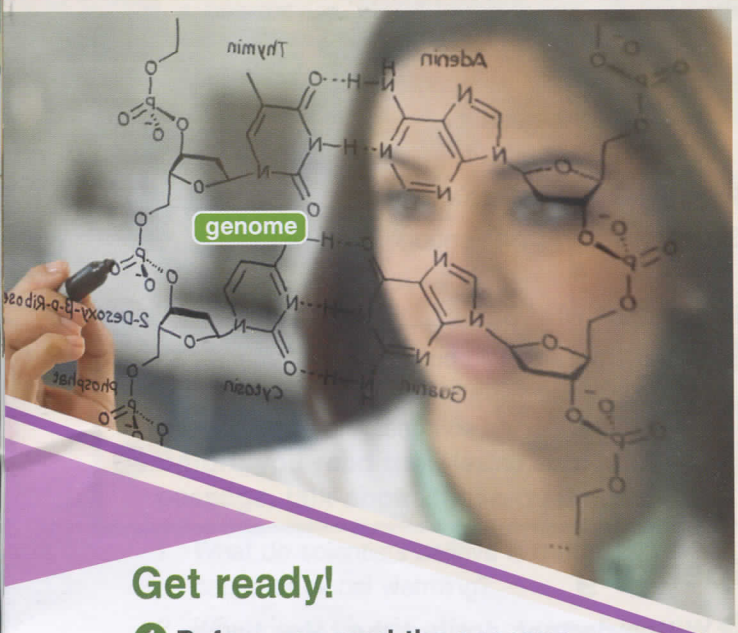
11 Genetic engineering

MODERN SCIENCE MONTHLY

GMOs: Friend or Foe



Scientists continue to debate the effects of **genetic engineering**. One classic example of the debate is a **transgenic organism** called **Golden Rice**. Scientists used **artificial selection** to **express** a gene in the white rice **genome**. Then, they performed **gene splicing** to add extra Vitamin A to the rice. Scientists say that this new **GMO** can reduce **vitamin deficiencies** in developing countries.

However, not everyone is happy about the new kind of rice. Some scientists, like Dr. Nick Marini, are worried about the **uncertainty** of genetic modification. He questions whether Golden Rice is actually a good thing. "I'm just not sure that artificially adding the vitamin to the rice is safe", he says. Others are concerned that such genetic engineering will encourage **cloning** of animals for consumption. Marini says "We can't predict how eating products created by artificial selection will affect people long-term."

Others, such as Professor Liam Jones, have a positive opinion. "GMOs can be **drought resistant**, disease resistant, and **tolerant** of many herbicides", he comments. For these reasons, Professor Jones points out, GMOs can be beneficial.

There are many different opinions in the scientific community. But it seems like genetic engineering is here to stay.

Golden Rice

Get ready!

1 Before you read the passage, talk about these questions.

1 What method do scientists use to modify genes?
2 What can prevent conventional crops from growing?

Reading

2 Read the article. Then, choose the correct answers.

1 What is the main idea of the article?
- A the scientific opinions on GMOs
- B the vitamins in Golden Rice
- C the ethics of cloning
- D the types of transgenic organisms

2 What is Dr. Marini concerned about?
- A the possibility of human cloning
- B creating disease resistance in crops
- C failing to reduce vitamin deficiencies
- D the long term effects of artificial selection

3 According to the article, which of the following is NOT a benefit of GMOs?
- A They can survive in droughts.
- B They are not killed by herbicides.
- C They can resist some types of diseases.
- D They are able to grow faster than non-GMOs.

Vocabulary

3 Match the words (1-10) with the definitions (A-J).

1 __ drought
2 __ uncertainty
3 __ clone
4 __ GMO
5 __ vitamin deficiency
6 __ gene splicing
7 __ Golden Rice
8 __ resistant
9 __ tolerant
10 __ express

- A the process by which one gene is inserted into another
- B an organism that has been modified artificially
- C a state of lacking vital nutrients
- D a period where there is very little rain
- E to make a genetically identical copy of an organism
- F a lack of certainty or knowledge
- G not being affected by something
- H a genetically-modified food
- I being able to endure the effects of something or exist around it
- J to display a trait controlled by a certain gene

4 **Read the sentence pairs. Choose where the words best fit the blanks.**

1 **genetic engineering / artificial selection**

A _____ includes cloning, gene splicing, and creating transgenic organisms.

B _____ is the process of identifying and bringing out a certain characteristic.

2 **transgenic organism / genome**

A DNA from different organisms is combined to create a _____.

B A _____ contains an organism's full set of DNA.

5 **Listen and read the article again. What concerns do some scientists have about cloning animals?**

Listening

6 **Listen to a conversation between two scientists. Mark the following statements as true (T) or false (F).**

1 __ The woman supports using GMOs.

2 __ The man thinks cloning animals can help people.

3 __ The speakers agree about cloning humans.

7 **Listen again and complete the conversation.**

Scientist 1: Tom, did you see the article in *Modern Science Monthly*?

Scientist 2: Which one?

Scientist 1: The one about Golden Rice. **1** _____ _____, the GMO.

Scientist 2: Ah, yes. The rice that will help people's **2** _____ _____. What a great scientific achievement!

Scientist 1: Do you think so? The way I see it, there's a lot of **3** _____ _____ GMOs.

Scientist 2: How so? Don't you think that **4** _____ _____ could save lives?

Scientist 1: Possibly, but I think that we don't know all the long-term risks yet. **5** _____ _____ might have many negative effects.

Scientist 2: I see your point. But I think **6** _____ _____ has more good results than bad.

Speaking

8 **With a partner, act out the roles below based on Task 7. Then switch roles.**

USE LANGUAGE SUCH AS:

What a great ...

Don't you think that ...?

I think it will lead to ...

Student A: You are a scientist. Talk to Student B about:

- an example of genetic engineering
- the benefits of your example
- his or her concerns about genetic engineering

Student B: You are a scientist. Talk to Student A about genetic engineering.

Writing

9 **Use the article and the conversation from Task 8 to summarize the debate on genetic engineering. Include the benefits of GMOs and the possible negative effects.**