

Active Reading

Section: The Structure of DNA

Read the passage below. Then answer the questions that follow.

In 1928, bacteriologist Frederick Griffith worked with two strains of *Streptococcus pneumoniae*. The first strain was enclosed in a capsule made of polysaccharides. The capsule helped make the microorganism able to cause disease. The second strain of *S. pneumoniae* lacked the polysaccharide capsule and did not cause disease.

Griffith knew that mice infected with S bacteria grew sick and died, while mice infected with R bacteria were not harmed. To determine if the capsule on the S bacteria was causing the mice to die, Griffith injected the mice with dead S bacteria. The mice remained healthy. Griffith then prepared weakened S bacteria by raising their temperature until the bacteria were “heat-killed,” meaning they were dead but maintained the capsule.

When Griffith injected the mice with the heat-killed S bacteria, the mice still lived. He then mixed the harmless live R bacteria with the harmless heat-killed S bacteria. Mice injected with this mixture died. Somehow, the harmless R bacteria underwent a change and became live, pneumonia-causing S bacteria. This phenomenon is now called *transformation*, a change in genotype caused when bacterial cells take up foreign genetic material.

SKILL: READING EFFECTIVELY

Read each question, and write your answer in the space provided.

1. What does the term *strain* refer to in the first sentence?

2. What effect might the polysaccharide capsule have on a bacterium contained within the capsule?

3. What does the term *transformation* mean?

Active Reading *continued*

4. What effect did an injection of R bacteria have on the mice Griffith studied?

5. What effect did an injection of heat-killed S bacteria have on the mice Griffith studied?

6. What effect did an injection of live R bacteria mixed with heat-killed S bacteria have on the mice?

In the space provided, write the letter of the phrase that best completes the statement.

- _____ 7. In order to determine whether the disease-causing properties of the S bacteria could be passed to the harmless R bacteria, Griffith injected mice with
- a. heat-killed S bacteria.
 - b. live R bacteria.
 - c. heat-killed R bacteria.
 - d. Both (a) and (b)