

## SECTION

## 3

## Enrichment

## Washing Away Decay

It may soon be possible to fight tooth decay by simply using a mouthwash. A new study of the decay-causing bacterium, *Streptococcus mutans*, or *S. mutans* has found a way to genetically alter this pesky resident of your mouth. Until now, *S. mutans* has lived quietly in your mouth feeding on sugars, along with 500 other bacteria that constantly live in your mouth. The waste product produced by this bacterium is lactic acid, a weak acid that, over time, destroys enamel and leads to cavities.

### Effector Strain

Dr. Jeffery Hillman, a professor of oral biology at the University of Florida, recently announced a successful experiment in which the genes in *S. mutans* responsible for producing lactic acid were removed. The new strain is called an effector strain because its genes have been changed. The new *S. mutans* does not produce lactic acid and, therefore, will not cause decay, according to Dr. Hillman.

The effector strain was put into the mouths of rats, where it dominated the original strain and kept it from growing on tooth surfaces. The effector strain was fed a high-sugar diet, but tooth decay did not occur. In fact, the sugar helped the new strain to colonize in places the old decay-causing strain used to inhabit. The rats showed no health problems related to the new bacterium.

### No More Cavities

Dr. Hillman and his team of researchers are hopeful that soon it will be safe to make a mouthwash containing the new strain which a dentist could squirt in a child's mouth. The bacteria would colonize on the teeth and help prevent the child from developing cavities. More research needs to be done but the new, genetically altered bacteria may prove to be a major step in the fight against tooth decay. However, Dr. Hillman warns that nothing will ever replace a good toothbrushing.

1. Why is the naturally occurring strain of *Streptococcus mutans* harmful to teeth?

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2. What was done to the new strain of *S. mutans* to make it harmless?

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3. What is an "effector strain" of bacteria?

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4. What happens to the old strain of *S. mutans* when the new effector strain is introduced into the mouth?

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