

Genetic Engineering Activity

The purpose of this activity is to simplistically show how specific gene from a donor cell is “cut” out and “inserted” into another species in order to carry out a specific purpose.

1. Pass out a Genetic Engineering Handout to each student.
2. Each student will also need a pair of scissors and tape. There does not necessarily need to be scissors and tape for everyone, they can be shared by 3-4 students.
3. Have students cut out the bacterial donor cell and the yeast cell, cutting along the dark, solid lines around the outside of each.
4. Then have the students tape the ends of the yeast cell in order to form a circle, simulating a cell.
5. They should then cut the Phytase gene from the bacterial donor cell. This will be along the dotted lines.
 - a. This simulates “cutting” a desired gene from a donor cell.
6. Then cut along the dotted lines of the yeast cell. This is basically “opening” up the DNA of the recipient cell where the new gene will be inserted.
7. Insert the Phytase gene into the yeast cell, the dotted lines should line up.
 - a. Note that the base pairs still match up appropriately (A and T; C and G). This is important, as this specific gene would not be able to be inserted if the base pairs did not match up appropriately.
8. Next, tape the two ends of the inserted gene.
9. The final product is a yeast cell with an inserted Phytase gene from a bacterial cell.
 - a. This is capable of mass producing the enzyme Phytase that can be added to poultry and swine diets to increase the availability of Phosphorus for the animal and decrease the potential for ground water pollution.