Obtaining the desired gene

Scientists use one of several methods to screen and isolate the cell with the library plasmid containing the desired gene.

Isolation of the bacteria with the desired gene

The bacteria are plated onto a selective medium. Only bacteria with the desired gene and the selection marker gene will survive. The bacteria serve as a ready supply of the desired gene for use by scientists.

Isolation of the desired gene

The library plasmids with the desired gene are placed in a test tube with a restriction enzyme. The enzyme cuts the DNA at specific sites and frees the desired gene from the library plasmid.

Separation of the desired gene

The transformation plasmid with the desired gene is separated from the bacterial cells and purified.

Preparation of the transformation plasmid parts

The desired gene, a selection marker gene, and "empty" transformation plasmid are cut to make them compatible for ligation.

Transference of the desired gene

Scientists choose an appropriate insertion method to insert the desired gene into the plant cells they are studying.

Ligation of the transformation plasmid parts

The desired gene, selection marker gene, and the "empty" transformation plasmid are combined in a test tube with a DNA ligase to seal the sticky ends of the DNA molecules together. This new bacterial transformation plasmid has incorporated the desired gene and the selection marker gene.

Propagating the genetically engineered plants

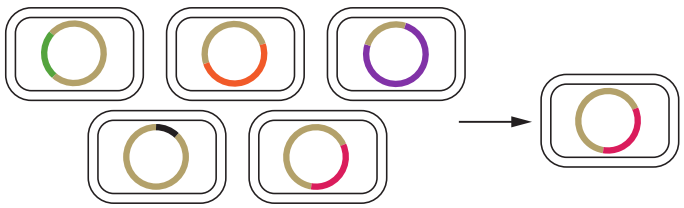
Plant cells are grown on selective media so that only the transformed cells carrying the new genes will grow. The media also contains substances that encourage the plant cells to grow into new plants.

Addition of desired gene to bacteria

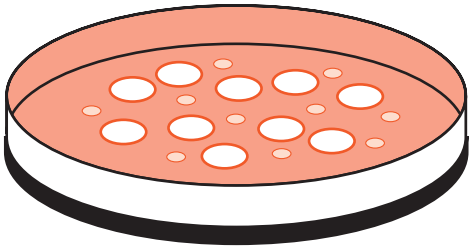
The transformation plasmid with the desired gene and the selection marker gene are added to bacterial cells.

Testing the genetically engineered plants

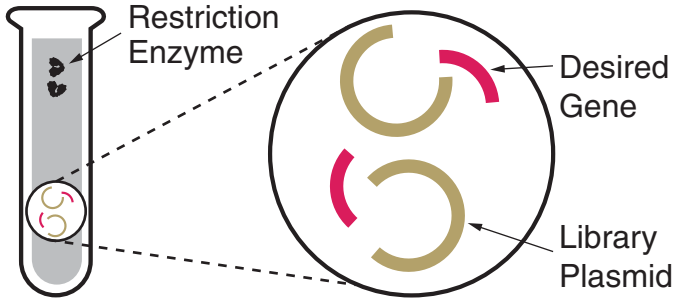
The plant is tested to determine if it incorporated the desired trait.

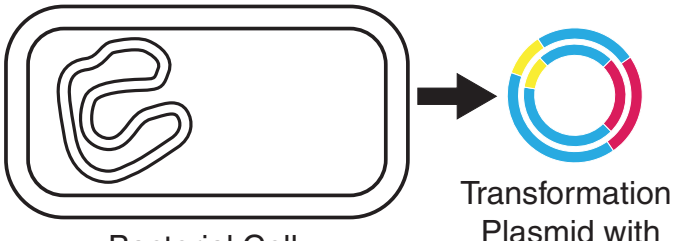


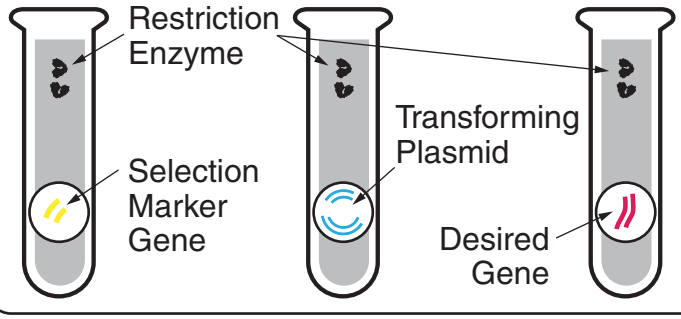
Screen Library and Isolate Cells

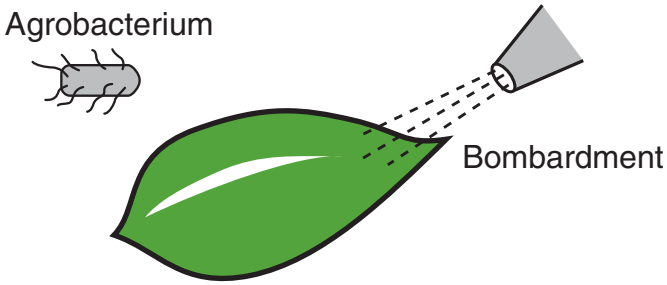


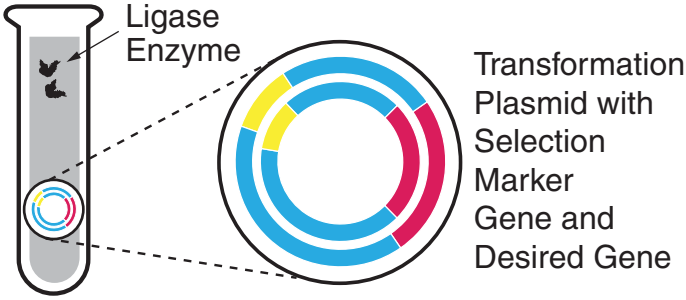
Bacterial Culture

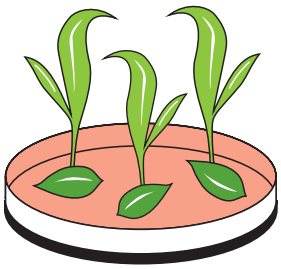




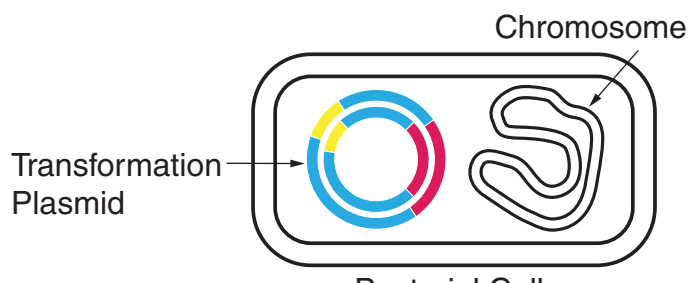








Culture of Genetically Engineered Plants



Plant with Desired Gene