



RAMA
UNIVERSITY

www.ramauniversity.ac.in

FACULTY OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY

MARKER GENE

Plasmids usually carry a *marker gene* which is used to reveal the cells which have been successfully engineered

These marker genes often coded for characteristics such as resistance to a particular antibiotic.

There were many concerns about the use of antibiotic resistance as marker genes, including the risk of them crossing into pathogens.

There are two types of marker gene:

1. Selectable Marker
2. Scorable Marker

1. A **selectable marker** is a gene inserted into a cell particularly a bacterium or to cells of culture that present a trait suitable for artificial selection.

They are a type of reporter gene used in laboratory microbiology, molecular biology, and genetic engineering to indicate the success of a transfection or transformation procedure to introduce foreign DNA into a cell.

For Example: Beta-lactamase (confers ampicillin resistance to bacterial hosts)

Neo gene from Tn5 (confers resistance to kanamycin in bacteria and geneticin)

2. **Scorable Marker** : In order to find alternatives to the use of antibiotics as selection agents, or cumbersome assays for the scorable markers, a targeted approach utilizing a RNAi technology to silence an expression of plant gene encoding Phytoene desaturase (PDS), a key enzyme of carotenoid synthesis pathway.