



FACULTY OF ENGINEERING & TECHNOLOGY  
DEPARTMENT OF BIOTECHNOLOGY

# AGROBACTERIUM MEDIATED GENE TRANSFER

- *Agrobacteria* are a group of Gram-negative, non-spore-forming soil bacteria, often isolated from abnormally proliferating plant tissues.
- Agrobacterium is known as genetic engineer and causes crown gall or hairy root diseases in plants.
- In the late 1970s, it was discovered that the plant phenotypes induced by *Agrobacterium*, crown gall or hairy roots, were due to the transfer of a particular DNA segment, called the transferred (T)-DNA, from the bacterium into the plant cell.
- Once stably integrated in the plant genome, the T-DNA element encodes
  - (1) plant hormones that result either in undifferentiated tumors or root proliferation,
  - (2) opines. Opines are sugar amino acid conjugates that *Agrobacterium* specifically catabolizes

There are two types of species of *Agrobacterium*

1. *Agrobacterium tumifaciens* (causes infection in wounded stem part of plant)
2. *Agrobacterium rhizogenus* (Causes infection in root of plant)

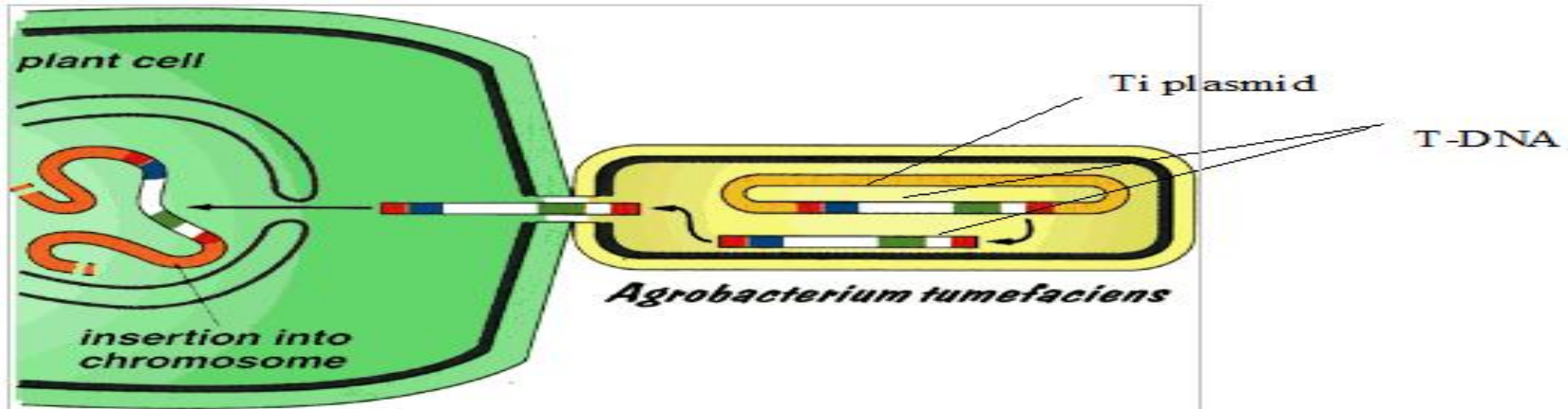
- *Agrobacterium tumifaciens* and *Agrobacterium rhizogenus* bacteria have ability to cause tumors in the plants due to presence of Ti plasmid and Ri Plasmid

Ti Plasmid (Tumor inducing) Plasmid

Ri Plasmid (hairy root inducing plasmid)

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## Ri & Ti Plasmid Maps

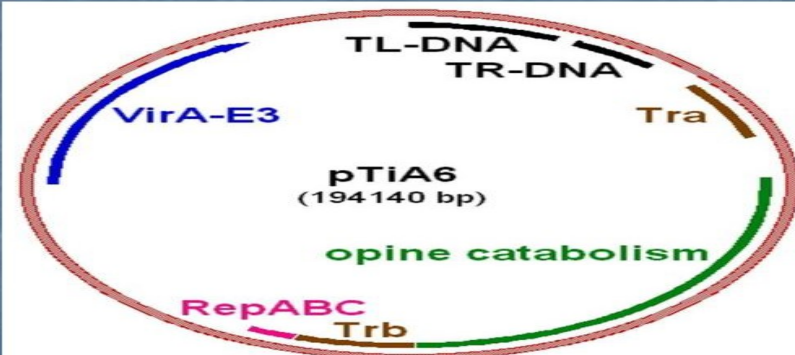
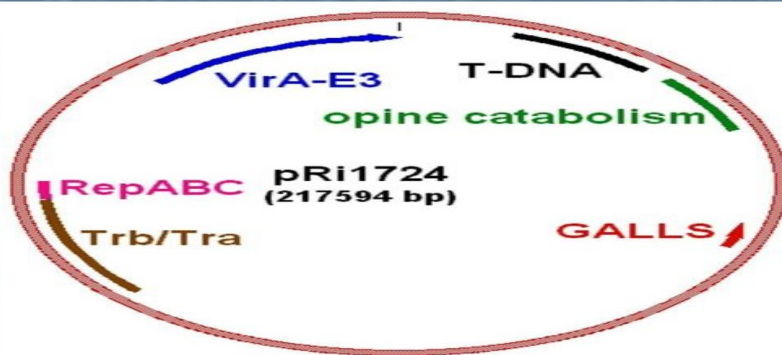


Image taken from Slideserve