

# Vectors

Another major component of a gene cloning experiment is a vector such as a plasmid. A Vector is a small DNA molecule capable of self-replication and is used as a carrier and transporter of DNA fragment which is inserted into it for cloning experiments. Vector is also called **cloning vehicle** or **cloning DNA**.

Vectors are of two types:

- i) Cloning Vector, and
- ii) Expression Vector.

Cloning vector is used for the cloning of DNA insert inside the suitable host cell. Expression vector is used to express the DNA insert for producing specific protein inside the host.

## Properties of Vectors

Vectors are able to replicate autonomously to produce multiple copies of them along with their DNA insert in the host cell.

- ❖ It should be small in size and of low molecular weight, less than 10 Kb (kilo base pair) in size so that entry/transfer into host cell is easy.
- ❖ Vector must contain an origin of replication so that it can independently replicate within the host.
- ❖ It should contain a suitable marker such as antibiotic resistance, to permit its detection in transformed host cell.
- ❖ Vector should have unique target sites for integration with DNA insert and should have the ability to integrate with DNA insert it carries into the genome of the host cell.

- ❖ Most of the commonly used cloning vectors have more than one restriction site. These are Multiple Cloning Site (MCS) or polylinker. Presence of MCS facilitates the use of restriction enzyme of choice.

