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CLONING VECTORS P-1

•Cloning vectors are DNA molecules that are used to "transport" cloned sequences between biological hosts and the test tube.

•Most vectors are genetically engineered.

•A vector is used to amplify a single molecule of DNA into many copes.

Cloning vectors share four common properties:

1. Ability to replicate.

2. Contain a genetic marker for selection.

3. Unique restriction sites to facilitate cloning of insert DNA.

4. Minimum amount of nonessential DNA to optimize cloning.

Types of vectors

•Bacterial plasmid

•bacteriophage

•Cosmids

•yeast artificial chromosome

•Different types of cloning vectors are used for different types of cloning experiments.

•The vector is chosen according to the size and type of DNA to be cloned

Bacterial plasmids

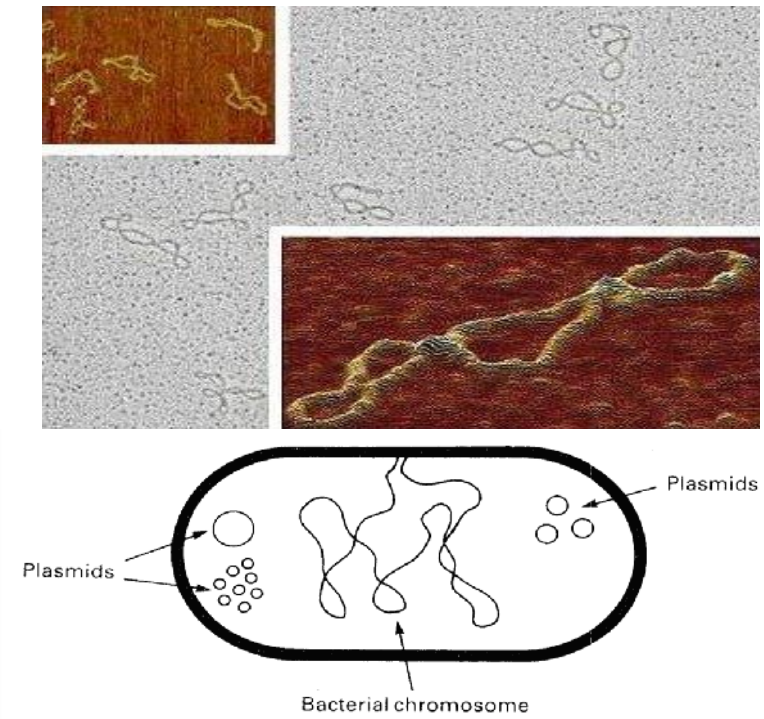
•Most bacterial DNA is on a single large chromosome, but some DNA is in a small circle called a **plasmid**.

Bacterial Plasmids in Nature

Occur naturally in bacteria and usually carry genes that are useful but not essential to survival

There can be as many as several hundred copies of a single plasmid in each bacteria.

They can replicate independently of the host cell.



Plasmids: independent genetic elements found in bacterial cells.

Size and copy number

Table 2.1 Sizes of representative plasmids

Plasmid	Size		Organism
	Nucleotide length (kb)	Molecular wt (MDa)	
pBR345	0.7	0.46	*E. coli*
pBR322	4.362	2.9	*E. coli*
ColEl	6.36	4.2	*E. coli*
RP4	54	36	*Pseudomonas* + others
F	95	63	*E. coli*
TOL	117	78	*Pseudomonas putida*
pTiAch5	213	142	*Agrobacterium tumefaciens*