PLASMID

MISS. A.ANITHA MARY

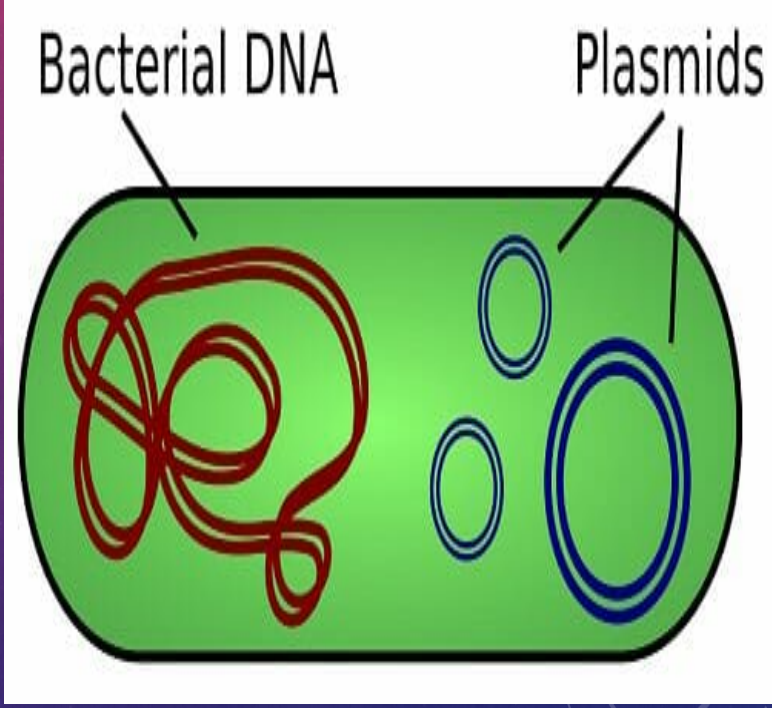
ASSISTANT PROFESSOR

PG & RESEARCH CENTRE OF ZOOLOGY

III UG ZOOLOGY (SF)

PLASMID

- A plasmid is a small, circular piece of DNA.
- That is different than the chromosomal DNA.
- which is all the genetic material found in an organisms chromosomes.
- This simplified figure depicts a bacterium's chromosomal DNA in red and plasmids in blue.



- Plasmids usually carry at least one gene.
- Many of the genes that plasmids carry are beneficial to their host organisms.
- Although they have separate genes from their hosts, they are not considered to be independent life.

PROPERTIES OF PLASMID:

- They are circular double stranded DNA molecules.
- They replicate independently.
- They have are origin of replication naturally in them.
- They are passed on to the daughter cells during cell division.
- They propagate the DNA fragment linked to them by in vitro ligation.
- They may be present in large in number of copies (more than 2-100).

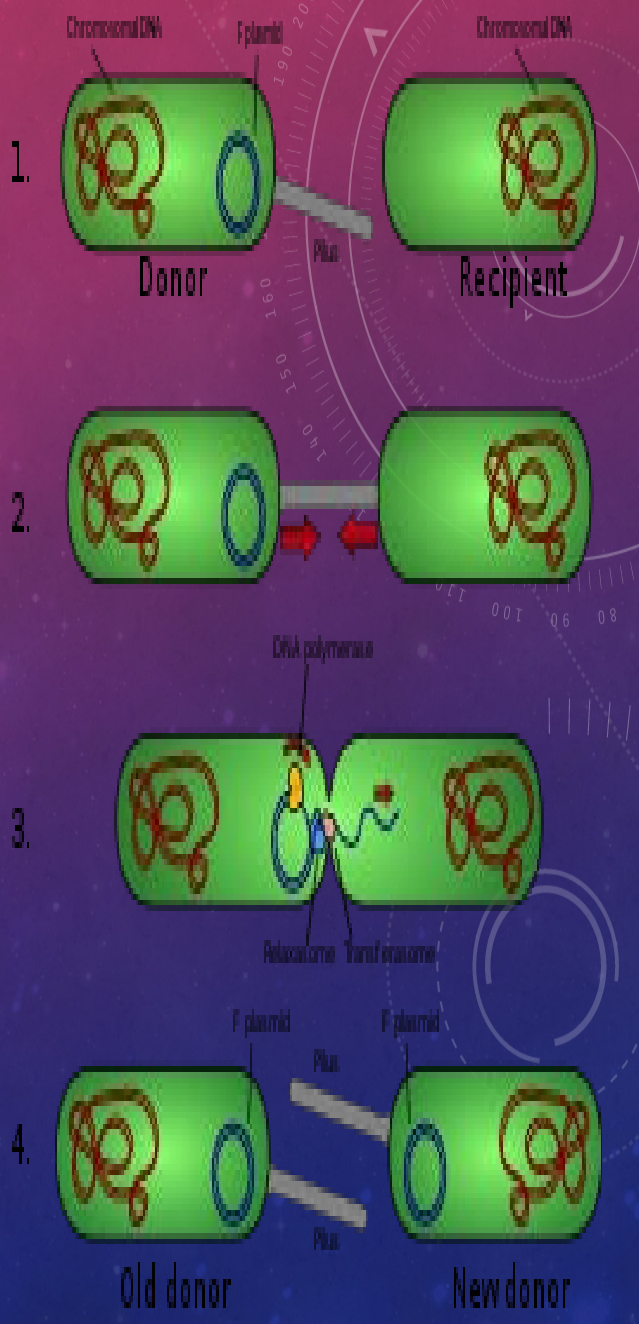
- They can acquire chromosomal genes by several mechanisms.
- Certain plasmids do not show any phenotypic traits, such plasmids are called cryptic plasmids.
- They have high transformation efficiency.
- They are low molecular weight.
- They are easily isolated & purified.

Types of Plasmids

Conjugative

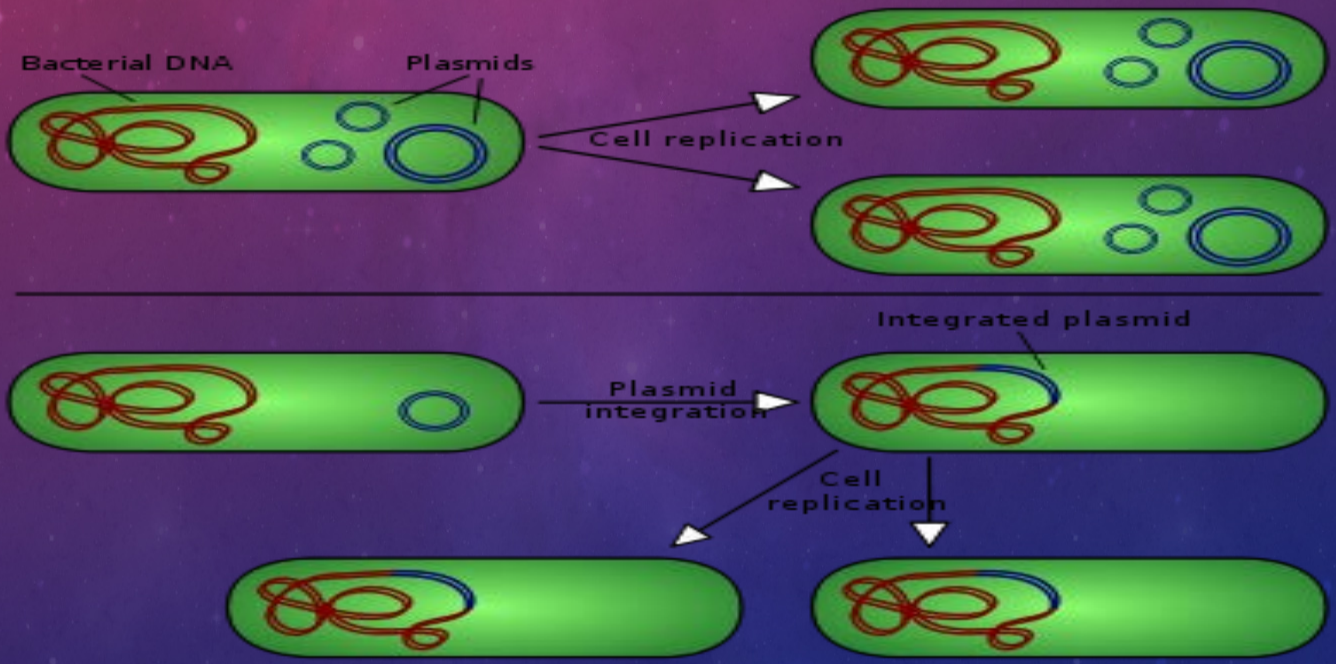
- Bacteria reproduce by sexual conjugation, which is the transfer of genetic material from one bacterial cell to another, either through direct contact or a bridge between the two cells.

- Some plasmids contain genes called transfer genes that facilitate the beginning of conjugation.



Non-Conjugative

Non-conjugative plasmids cannot start the conjugation process, and they can only be transferred through sexual conjugation with the help of conjugative plasmids.



Specific Types of Plasmids

- ✓ Fertility F-plasmids
- ✓ Resistance Plasmids
- ✓ Virulence Plasmids
- ✓ Degradative Plasmids
- ✓ Col Plasmids

Fertility F-plasmids

- Fertility plasmids, also known as F-plasmids, contain transfer genes that allow genes to be transferred from one bacteria to another through conjugation.

- F-plasmids are episomes, which are plasmids that can be inserted into chromosomal DNA.

- Bacteria that have the F-plasmid are known as F positive (F^+), and bacteria without it are F negative (F^-).

Resistance Plasmids

Resistance or R plasmids contain genes that help a bacterial cell defend against environmental factors such as poisons or antibiotics.

Some resistance plasmids can transfer themselves through conjugation.

Virulence Plasmids

❖When a virulence plasmid is inside a bacterium, it turns that bacterium into a pathogen, which is an agent of disease.

❖ Bacteria that cause disease can be easily spread and replicated among affected individuals.

❖The bacterium *Escherichia coli (E. coli)* has several virulence plasmids.

Degradative Plasmids

- Degradative plasmids help the host bacterium to digest compounds that are not commonly found in nature.

- These plasmids contain genes for special enzymes that break down specific compounds.

- Degradative plasmids are conjugative.

Col Plasmids

- Col plasmids contain genes that make bacteriocins (also known as colicins), which are proteins that kill other bacteria and thus defend the host bacterium.

- Bacteriocins are found in many types of bacteria including *E. coli*, which gets them from the plasmid ColE1.

THANK YOU

Pea trait	Dominant trait	Recessive trait
Seeds		
Seed shape	Round 	Wrinkled 
Seed colour	Yellow 	Green 
Flower colour	Purple 	White 
Flower position	Axial 	Terminal 
Plant height	Tall 	Short 
Pod shape	Inflated 	Constricted 
Pod colour	Green 	Yellow