Conjugation

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BACTERIAL CONJUGATION WAS FIRST DISCOVERED BY

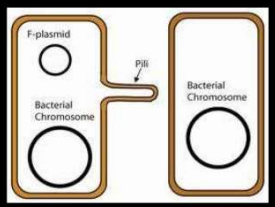
Lederberg And Tatum
IN 1946
IN *Esch.coliK12* STRAINS

- Gene transfer refers to the movement of genetic information between organisms. Gene transfer can be *horizontal* or *vertical. Transfer of genes from parents to offsprings is termed as vertical gene transfer whereas transfer of* genes between two independent organisms is called *horizontal or lateral gene transfer.*
- *Sexual reproduction in* eukaryotes is an example of vertical gene transfer. *Prokaryotes do a vertical gene transfer when they reproduce* by binary fission.
- Prokaryotes can also do horizontal gene transfer when they pass the gene to other prokaryotic cells.
- Three mechanisms of horizontal gene transfer in prokaryotes have been discovered.
- These are *transformation,transduction and conjugation.*
- Conjugation is the transfer of genes between bacteria that depends upon direct cell-cell contact

- The fragment of DNA that has been transferred during horizontal gene transfer from a donor cell to a recipient cell is referred to as an **exogenote.**
- **The recipient bacterial cell's own genetic material into which the donor DNA can**

CONJUGATION

BACTERIA A

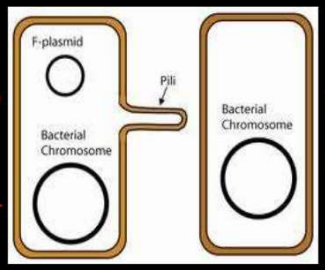


BACTERIA B

TRANSFER OF GENETIC MATERIAL FROM BACTERIA A TO BACTERIA B BY MATING OR CONTACT IS CALLED CONJUGATION.

WHO IS A DONOR?

F PLASMID
DONOR
F +
MALE CELL



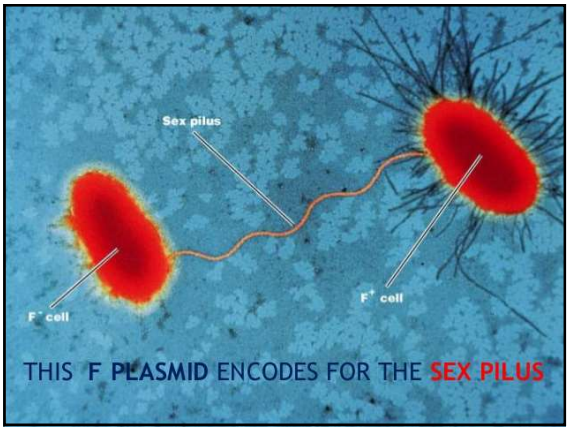
ABSENT
RECIPIENT
F –
FEMALE

F PLASMID

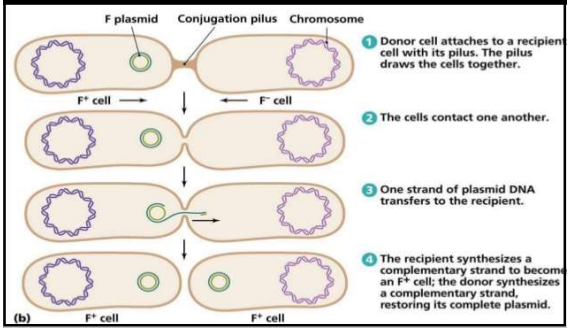
FERTILITY FACTOR

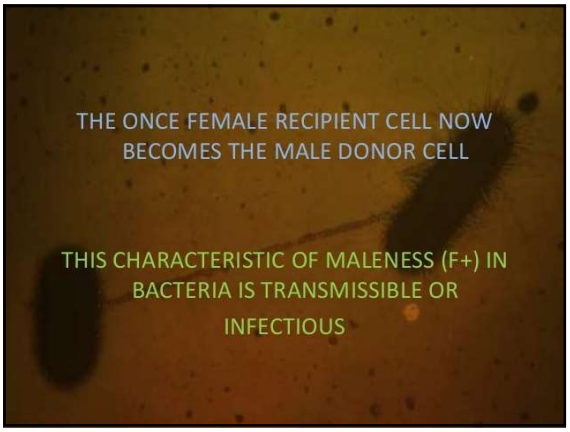
SEX FACTOR

TRANSFER FACTOR



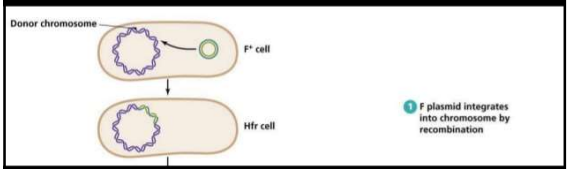
WHAT HAPPENS DURING CONJUGATION?



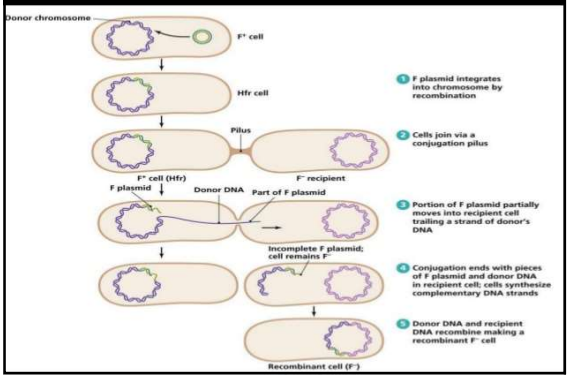


What is Hfr cell?

When F factor/ plasmid exists in an integrated state with the host chromosome



Hfr CONJUGATION



F+ (free plasmid) ⇌ Hfr (integrated)

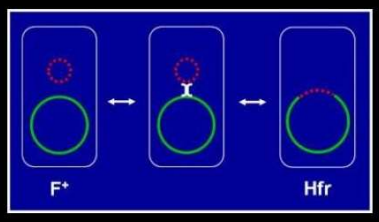
REVERSIBLE

TURNS A (F-) INTO A (F+) UPON CONJUGATION

CONJUGATION WITH A Hfr , AN (F-) RARELY BECOMES (F+) BUT IT RECEIVES CHROMOSOMAL DNA FROM THE DONOR

REVERSIBLE

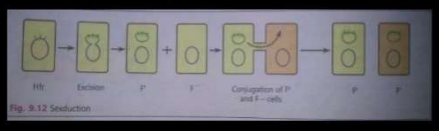
(F+) ⇌ Hfr



F+ ⇌ Hfr

REVERSIBLE

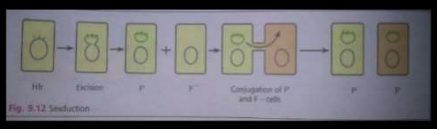
WHEN THE F FACTOR REVERTS FROM INTEGRATED ⟶ FREE STATE IT MAY SOMETIMES CARRY WITH IT SOME CHROMOSOMAL DNA FROM ADJACENT SITE OF ITS ATTACHMENT



SUCCH AN F FACTOR IS KNOWN AS F' FACTOR

(F') + (F-) ⟶ SEXDUCTION

WHEN (F') CONJUGATES WITH A RECIPIENT (F-), IT TRANSFERS, ALONG WITH THE F FACTOR, THE HOST DNA INCORPORATED WITH IT.



THANKYOU