Conjugation

Conjugation is a gradual, controllable process. A **cytoplasmic connection** between the two bacteria involved in the process is established in the form of a narrow tube. Afterward, a part or all of the genome is transferred from the donor cell to the recipient cell.

The presence of **sex chromatin (F-factor)** determines the ability to transfer part of its genetic equipment to another bacterium. F-factor is encoded on a plasmid **(F-plasmid)**. We call such cells **F +** and they are always **donors of genetic information.** F factor genes determine the formation of fimbriae **(F-pili)** on the surface, which allows contact between bacteria. The F + bacterium specifically binds to the surface of the recipient bacterium and transfers a single strand of its F-plasmid to it. The second strand is then synthesized in both bacteria.

The F plasmid replicates independently of the cell's chromosome. After F-plasmid transfer, the **F - cell transforms into an F + cell** and is also able to pass on its genetic information. The F plasmid may be integrated into the **main chromosome** (using insert sequences). The transferred part of the chromosome of a donor cell can recombine with the main chromosome of the recipient cell. Such cells show a high frequency of gene recombination and are referred to as **Hfr bacteria**.

The described process is typical for **gram-negative** bacteria. **Gram-positive** bacteria do not use pili, but instead use **adhesins**, which temporarily connect the cells to allow conjugation.

References

Related articles

- Horizontal gene transfer in bacteria
  - Transformation
  - Transduction

Source

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