

Conjugation Encyclopedia Article

Conjugation

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Conjugation

Conjugation is a process by which genetic material is transferred between two bacterial cells that are temporarily joined. It is a type of genetic recombination, and is the bacterial version of sex.

During conjugation, two bacterial cells join through an appendage known as the sex pili. One cell is the "male" and it is the DNA donor. The other is the "female" which is the DNA recipient. When they connect, a cytoplasmic bridge is made between the respective cell membranes. DNA in the form of a plasmid is then passed from one cell to the other through this bridge.

For conjugation to take place, the donor bacterial cell must have a resident F plasmid. This is a small, circular stretch of DNA that is separate from the bacterial chromosome. Plasmids are foreign pieces of genetic material that typically replicate independently. Unlike viral genetic material, they are generally beneficial to bacteria.. The F plasmid, or fertility plasmid, contains about 25 genes that produce proteins related to the sex pili. At certain times, the F plasmid can become integrated into the bacterial chromosome. When this happens copies of some of the bacterial genes are transferred along with the F plasmid genes. This causes the recipient cell to have extra genes which can undergo recombination with the cell's own genes. When the cell divides via binary fission, a new colony of recombinant bacteria is formed.