

# Conjugation, transformation, transduction

**Conjugation-** Conjugation is the transfer of DNA from one cell to another through direct cell to cell contact. DNA transferred by conjugation involves circular pieces of DNA called plasmids. Plasmids replicate in the bacterial cell, independently of the chromosome and contain separate genetic information. Many virulence factors are encoded for by bacterial plasmid DNA. The conjugative transfer of plasmids is carried out by cell surface structures that insert the plasmid DNA into other neighbouring cells.

**Transformation-** Bacteria are capable gaining DNA directly from their environment and incorporating it into their own genome through a process is known as natural transformation. This DNA usually comes from lysis of bacteria and the subsequent release their genetic contents into the surrounding area.

**Transduction-** Transduction is the transfer of bacterial DNA from one cell to another by a viral vector known as a bacteriophage which specifically infects bacteria. Bacteriophages are not equipped with machinery to self-replicate their genomes or express their own genes. Instead, they takeover bacterial machinery to do so. Once infected, phage viruses will replicate until the bacterial cell lyses, releasing phage into the surrounding area. Occasionally, small sequences of bacterial DNA may be incorporated into the new phage viruses. These modified phages, called recombinant virus particles, then go onto infect more bacterial cells and distribution of bacterial DNA occurs.