

- **Conjugation**

- Conjugation requires **direct contact** between the donor and recipient cells
 - It is an **important mechanism** in both Gram-positive and Gram-negative bacteria
 - In Gram-positive bacteria, the **cell walls of each cell stick together** using a **conjugation pilus** (located on the F plasmid)
 - In Gram-negative bacteria, the **process is much more complicated**
- The process is as follows (see below):
 - The **donor bacterium produces a pilus** and **attaches to the recipient bacterium**
 - **DNA helicase then unzips one strand of the plasmid** which travels across the pilus to the recipient
 - This begins at a specific site known as the **origin of transfer**
 - The information on this plasmid **contains the information for pili synthesis**
 - Both the donor and recipient will then synthesise a complementary strand to the plasmid, allowing **each organism to have one full copy**
 - The **recipient can now become a donor**, and so can conjugate with other cells
- **Plasmids are the most common vectors used in genetic transformation**, they contain three key elements (see bottom):
 - **The origin of replication**
 - **A selectable marker gene**
 - Such as antibiotic resistance
 - **A cloning site**
 - An area within the plasmid where new DNA is inserted

