

A) Transformation — It is the process of genetic recombination in which fragments of DNA from one cell enters and is integrated into another cell. As a result the recipient cell is transformed.

Transformation was discovered by Griffith (1928) in Diplococcus pneumoniae. This bacterium has two strains viz. the wild type strain and the mutant strain. The wild type strain bears smooth surface and is virulent while the mutant strain bears rough surface and is avirulent. The avirulent form is transformed into virulent form by a process called transformation in the following way:-

i) Binding of virulent DNA :- In this stage a portion of virulent DNA present in the external medium binds with the cell wall surface of the recipient avirulent cell. The external donor DNA binds to the cell surface of recipient cell at several receptor site which appear to be associated with mesosome.

ii) Penetration :- In this stage the permanently bound donor DNA penetrates the recipient bacteria. The donor DNA migrates from the periphery of the recipient cell to the nucleoid.

iii) Synapsis :- The recipient DNA unwinds and initiate pairing with the single stranded donor DNA. This

pairing is the result of the base pairing between the donor and recipient DNA.

i) Integration :- In this stage the donor DNA becomes integrated within the recipient DNA. As a result the recipient avirulent cell is transformed into a virulent cell and all the progenies of this cell become virulent.

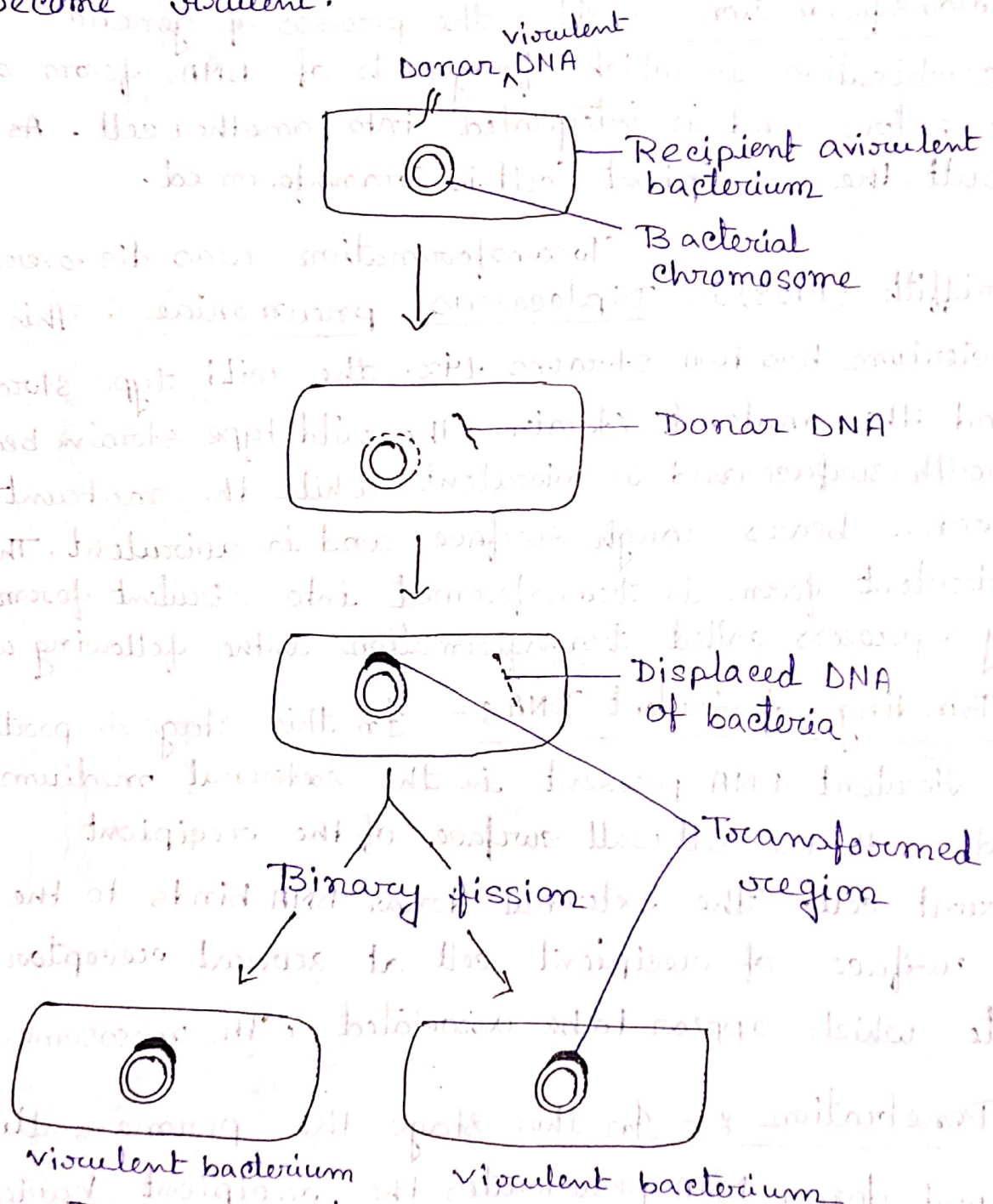


Fig:- Diagrammatic representation of transformation