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MCB202

1. Microbial variation and hereditary — Discuss
2. Explain microbial recombination.

1. Any change in the genotype of a bacterium or its phenotype is known as variation. Genotypic variation can occur as a result of changes in the gene by way of mutation loss or acquisition of new genetic elements, phenotypic variations are seen temporarily when bacteria are grown under certain environmental condition.

* Heriditary variation in bacteria results from changes in the genetic structures in distinction from plants and animals, bacteria are predominantly haploid organisms, the contain one genome and combine within themselves the function of the gamete and the individual.

* Non heriditary variation is a kind of variation that is found quite frequently. It occurs under comparatively mild effect of the environment on microbes due which the ensuing changes are not fixed in a hereditary sense.
For example, strains of coli-bacili which grow on agar with sodium ricinoleate form long filaments. upon the addition of calcium chloride. these cells becomes quite short. A deficency of calcium in the medium provokes an increase in spore production and a slimy growth in anthrax bacili

* NB! Hereditary format variations in bacteria is expressed in the form of mutation and recombination.

Bacterial recombination is a type of genetic recombination in bacteria characterized by DNA transfer from one organism called donor to another organism as recipient. This process occurs in three main ways

Transformation

The uptake of exogenous DNA from surrounding environment

Transduction

The virus-mediated transfer of DNA between bacteria

Conjugation

The transfer of DNA from one bacterium to another via cell to cell contact.

The final result of conjugation, transduction and transformation is the production of genetic recombinants, individuals that carries not only the genes we inherited from their parent cells but also the genes introduced to their genomes by conjugation, transduction and transformation.

Recombination in bacteria is ordinarily catalyzed by a RecA type of recombinase. These recombinases promote repair of DNA damages by homologous combination.