Name: Wokoma Olobo Benebo
Department: Medical Laboratory Science
Matric Number: 18/MHS06/055
Course: MCB 202

ASSIGNMENT!!

1. Discuss microbial variation and hereditary in bacteria
2. Explain microbial recombination

Answer!!

1a). Bacteria Variation:

When a bacterial cell divides, the two daughter cells are generally indistinguishable. Thus, a single bacterial cell can produce a large population of identical cells or clone. On solid medium, a clone is manifested as an easily isolated colony. Occasionally, a spontaneous genetic change occurs in one of the cells. This change (mutation) is heritable and passed on to the progeny of the variant cell to produce a subclone with characteristics different from the original (wild type) parent. This is termed vertical inheritance. However, if the change is beneficial, the subclone may overtake the wild type population. This is an example of how evolution is directed by natural selection. Spontaneous mutations are of two classes: (1) point mutation and (2) DNA rearrangement. Bacterial variation can also occur by horizontal transfer of genetic material from one cell to another.

1b). Bacterial Heredity:

This is the study of how genetic information is transferred, either form a particular bacterium to its offspring or between interbreeding lines of bacteria, and how the genetic information is expressed. Occasionally, genetic variation or the transfer of genetic information between bacteria gives rise to mutations. The large sizes of bacterial populations ensure that even extremely rare genetics events are likely to occur. This genetic variation makes it possible for individual members of huge populations of bacteria to evolve new traits rapidly.

2). Explain Microbial Recombination

It 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 the 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 carry not only the genes they 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 recombinations.

The ability to undergo natural transformation is present in at least 67 bacterial species. Natural transformation is common among pathogenic bacterial species. Bacterial transformation is carried out by numerous interacting bacterial gene products.