

Prophage

→ The DNA of temperate phage integrated into bacterial DNA

- ↳ Lyogenic phage
- lyogenic bacteria

Mutation

A small heritable change of bacterial gene
Spontaneous inducing ($10^{-6} - 10^{-9}$), there different types of mutation namely;

- i. Base replacement
 - Transitions and Transversions
- ii. Base deletion/loss
- iii. Base insertion

Genetic substance of bacteria is transferred to another bacteria

Donor bacteria: provide genetic substance

Recipient bacteria: accept genetic substance.

2. Microbial 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 the surrounding environment.

Week 2 questions answer sheet

date: 02/11/2022

Subject: Microbiology

MCE 202 Assignment

1. Discuss Microbial Variation and heredity in bacteria
2. Explain Microbial recombination

Answer:

1. Bacterial heredity and variation

Concept:

- Heredity (Inheritance) the "likeness" of the characteristics of progeny and parents

- Variation: the "difference" between progeny and parents

* Heritable Variation

- Genetic Substance Changes

* Non-heritable Variation

- Environment Changes

Variation Examples

- i. Shape and structure variation eg L-forms
- ii. Colony variation eg Smooth and rough colony
- iii. Virulence Variation eg PCP / 230 genomes, 13 years vaccine
- iv. Resistance Variation

Plasmid - They are extra-chromosomal genetic substance (binding to chromosome... episome) Circle double strand DNA

- i. Autonomous replication
- ii. Control most of auxiliary functions of bacterial cell
- iii. dispensable, it can be lost
- iv. transfer from a bacteria to another
- v. Incompatibility and Coexistence

Bacteriophage - Bacterial Virus

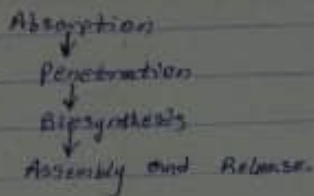
- i. Viral carriers prepares smallest sized structure / DNA/RNA
- ii. Protein particles in living cell
- iii. Widespread existence
- iv. High host-specific parasites

Biological Properties

- i. Shape and Structure
- ii. Antigenicity
- iii. Resistive

Virulent Phage

- Replicate in cell and released in lysis of B.



Lytic development

- i. Infection - Phage attaches to bacterium
- ii. DNA Injection - Phage injects DNA into bacterium
- iii. Early Infection - Phage DNA replication starts
- iv. Late Infection - Heads, tails and fibres are made.
- v. Phage assembly - DNA is packaged into heads, tails become attached.
- vi. Lysis - Cell broken and progeny released.

Temperate phage

- Infected bacterial phage does not replicate, it's genome integrated with bacterial DNA, it's replication is associated with bacterial DNA.