

VIRAL GENETICS & MODE OF VIRAL INFECTION

Ques. Describe in detail the mode of viral infection?
[Viral genetics].

Ans. The virus particles are non-motile and ~~and~~ ^{reach} to the host positively through cell sap of the previous host, water or insects. During the growth of virus two types of life cycles are possible, which are commonly called as growth cycle of viruses. Because they are responsible for causing infection so, they are also termed as mode of infection of viruses. The two cycles are:—

① Lytic cycle → Some viruses multiply as soon as they enter the host cell, resulting in the break-down of (lysis) of the host cell and ultimately kill them. Such viruses are called lytic viruses and their mode of infection is said to be Virulent. It is recorded in case of T. Evenphages viruses, also called as T-series-phages which attack E. coli. In such case large number of newly formed virus particles are liberated.

② Lysogenic cycle → In this type of life cycle, viruses don't cause lysis of the host cell, in the usual way. The viral chromosome becomes integrated with the host chromosome - the stage is known as PROPHAGE. Such viruses are called lysogenic viruses, and their mode of infection is said to be temperate. Here the viruses don't multiply. Its best studied temperate phase is λ (lambda) phage.

of the bacterium E. coli.

Lytic Cycle \Rightarrow This cycle occurs in T-series phages which attack E. coli. The whole cycle and their genetical aspect can be studied in following nine steps:-

1) **Adsorption \rightarrow OR Attachment** \rightarrow The bacteriophage attaches itself to the receptor sites on the wall of certain specific strains of E. coli Bacteria. The adsorption is ^{mainly} done with the help of tail fibres.

2) **Digestion of the Bacterial cell wall** \rightarrow A small region of the cell wall of the bacteria is digested by the help of an enzyme named as Lysozyme, attached to the tail fibre. This enzyme makes a hole in the layer of the cell wall, so that the DNA of the virus may get its entry inside the bacterial body.

3) **Injection of DNA** \Rightarrow Contraction of tail sheath pushes the core tube through the cell wall of the host cell and the DNA is injected into the bacterial cell. The contraction of tail sheath brings the collar and the base plate nearer. After contraction, the discs in the protein sheath are reduced to about half of the original number. The tail sheath contains ATP (In form of Energy), the enzyme ATPase and contractile protein. All the three are mainly responsible for the injection and other metabolic activity inside the bacterial cell.

The ~~phage~~ phase DNA carries