

## Lecture-3

### Virus and Cell Organelles

#### **1. In what ways do viruses be similar to living organisms?**

**Answer:** Viruses and living organisms both have protein and genetic material (RNA or DNA) and both can reproduce.

#### **2. What are different types of nucleic acid found in viruses?**

**Answer:** A virus has either DNA or RNA genes and is called a DNA virus or a RNA virus respectively. The vast majority of viruses have RNA genomes. Plant viruses tend to have single-stranded RNA genomes and bacteriophages tend to have double-stranded DNA genomes.

#### **3. Explain why the T4 phage genome is circularly permuted?**

**Answer:** The T4 phage genome is circularly permuted. Circular permutation means that the starting point in the linear genome (one end of the molecule) differs for various members of a particular virus population. Circular permutation is a consequence of the viral genome being replicated by a complex rolling circle mechanism. Each phage head capsidates one full genome length of DNA plus a bit more. The generation of such circularly permuted genomes also means that there is no unique packaging signal for T4 DNA.

#### **4. Compare the animal and plant viruses in different aspects?**

**Answer:** Plant viruses are similar to animal viruses in most basic characteristics but they can also be markedly different. Most plant viruses have RNA as the genetic material. Animal viruses enter host cells by a process called endocytosis. Plant viruses, by contrast, enter through wounds in the cell's outer coverings--e.g., through abrasions made by wind or through punctures made by insects.

#### **5. Distinguish between lytic and lysogenic cycles of viruses?**

**Answer:**

##### **Lytic cycle**

- Host bacterium undergoes lysis, i.e it is destroyed
- Progeny phage are produced
- It cannot be converted into lysogenic cycle

##### **Lysogenic cycle**

- Host bacterium is not affected .there is a symbiotic relationship between the bacterium and the phage
- DNA of the phage becomes part of the bacterial chromosome.
- No progeny particles produced
- It can be converted into lytic cycle by exposure to certain chemical and physical agents like UV rays,hydrogen peroxide and nitrogen mustard