

The Virus and its characters

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Introduction

The term 'virus' is derived from Latin which means Poison or venom

In 1886, Adolf Meyer observed viruses in Tobacco plants and the viruses were TMV(Tobacco Mosaic virus).

Virus is an ultra microscopic, infectious agent that are metabolically inert and which multiply only within the living cells or host.

General characterster of virus

- Viruses are metabolically inert
- Viruses are obligate intracellular parasites
- Viruses cannot make energy or proteins independent of a host cell
- Viruses multiply inside the living cells using host cell machinery.

Virus as a living thing

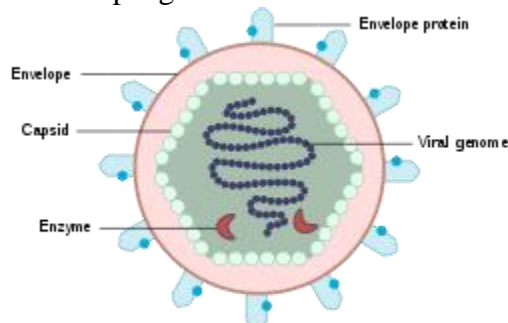
- Viruse occurs in different strains.
- Virus have their own genetic material
- Virus can undergo mutation
- They get destroyed by ultraviolet rays

Virus as a non-living thing

- They lack a cellular structure
- They do not respire
- They do not move, grow.
- They can be crystallised and stored in bottles like chemicals
- They lack enzyme system and donot have metabolic activity of their own.

Habitat

- Viruses are not able to survive without a host cell, so active viruses reside inside a host body.
- They are present either in bacterial cell, animal cell or plant cell. Eg. Herpes virus, TMV, bacteriophages.



Size of viruses

- Viruses are much smaller than bacteria
- Viral size ranges from 20-1400nm.
- Poliovirus is of 30nm
- Giantmimi viruses are upto 800nm.

Different shapes of viruses

They are rod shaped, bullet shaped, filament shaped, icosahedral shape and tadpole shaped.

Viral structure

- Virus consists of nucleic acid and a protein.
- Genome or nucleic acid is covered by protein coat called capsid.
- Some viruses have envelop outside the capsid.
- Capsid without the envelop is called Naked.

Viral genome

- It consists of either deoxyribonucleic acid(DNA) or ribonucleic acid(RNA)
- It may be single stranded or double stranded.
- Either circular or linear genome

Viral capsid

- Viral nucleic acids surrounded by protein coat called capsid.
- Viral capsid is of 3 types
 - Helical
 - Icosahedral
 - Complex

Helical symmetry

- Filamentous capsid
- Long tube of protein with genome inside, eg. Influenza virus, rabies virus.

Cubic or Icosahedral symmetry

- It is made up of Icosahedral capsid
- It has 20 triangular sides, eg. HIV, Hepatitis B virus, Adenovirus

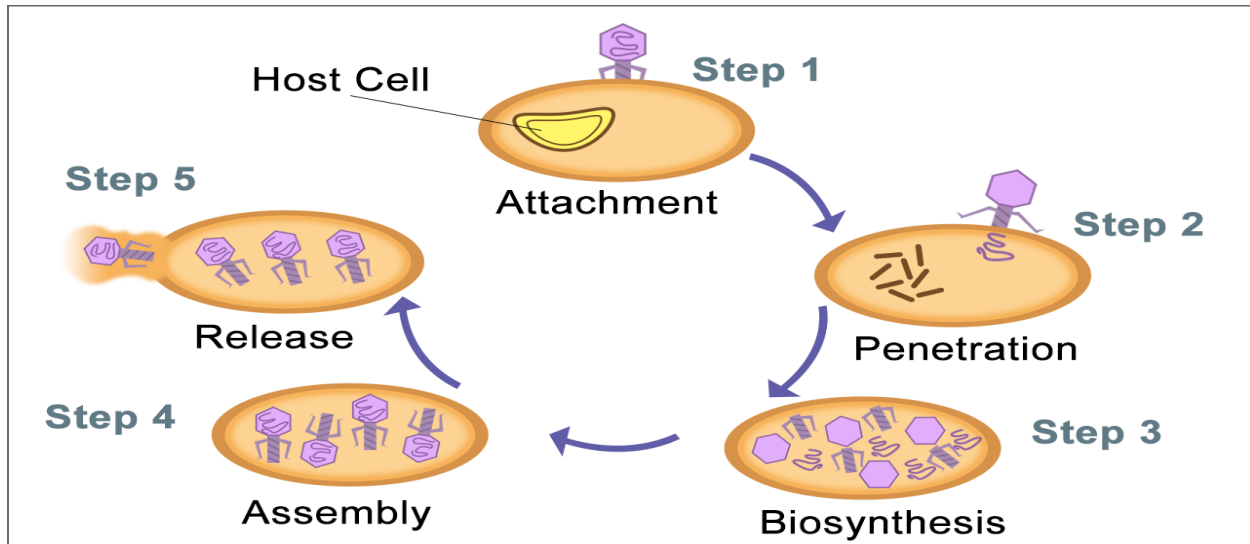
Complex Symmetry

- The head of the virus is cubic and tail is helical
Eg. Pox viruses, Bacteriophage.

Replication

- Viral replication includes 2 types
 - Lytic cycle
 - Lysogenic cycle

Lytic cycle includes 5 types in viral replication



1. Attachment
2. Penetration
3. Biosynthesis/ Replication of Nucleic acid
4. Assembly/ Maturation
5. Release of new virions

Conclusion

All viruses are not infectious, but the infectious viruses replicate only inside the host. It attacks plants, animals and bacteria cells. They exhibit both living and non –living characters.

Reference

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