

VIRUS- GENERAL TRAITS AND THEIR BIOTIC AND ABIOTIC NATURE

GENERAL CHARACTERS OF VIRUSES

- (1) They do not occur free in nature but act as obligate intracellular parasite.
- (2) They are extreme microscopic structure which can only be seen by electron microscope.
- (3) Mainly the size ranges from 100-2000 millimicron.
- (4) They can not be filtered by bacterial filters.
- (5) The genetic material is either DNA or RNA (but not both) which occurs in the form of single molecule and can be single or double stranded.
- (6) A single virus particle is known as virion which lacks functional autonomy.
- (7) They lack their own enzyme system but interact with the host enzyme system and synthesize new virus particles. Thus they have a master and slave relationship.
- (8) Outer capsid of virus is proteinaceous and harmless and provide cellular specificity to the virus.
- (9) They are intracellular obligate parasite and can't be cultured on artificial culture media.
- (10) All animal and plant viruses have a narrow host range while others show a broad host range.
- (11) They show replication.
- (12) They are highly infectious and spread disease very quickly.
- (13) They show special kind of pathogenecity i.e. they cause disease at particular temperature. Most of virus become inert at 56-69°C (for 30 minutes)
- (14) They are haploid.
- (15) They are uneffected by antibiotics.
- (16) They show life between 5-9 pH.
- (17) They remain active for a long time when kept in 50% glycerol solution.
- (18) The extract of virus become inert at high pressure and high sound frequency.
- (19) They get precipitated with ethyl alcohol and acetone.
- (20) They can be inerted by treatment with ultraviolet rays, pyridine, urea and hydrogen peroxide.
- (21) They can be crystallized.
- (22) They show response toward temperature, radiation and chemical substances.
- (23) They lack cell wall, nucleus, protoplasm and cell organelles.

NATURE OF VIRUSES

The nature of viruses is still not clear, because it is not easy to define them within the accepted framework of living or non living organisms. Some virologist regard viruses as animate object (when present inside the host cell) whereas other consider them inanimate (when present outside the host cell).

Viruses are living because:

- (i) They show growth and multiplication (only inside the host cell).
- (ii) They have genetic material i.e. DNA/RNA.
- (iii) They can direct protein synthesis (though they use host machinery for it).
- (iv) They show mutation.
- (v) They can be transmitted from the diseased host to the healthy ones or posses the ability to infect.
- (vi) They react to heat, chemicals and radiation and also shows irritability, a character of only living organisms.
- (vii) They posses genetic continuity and have definite races/strains.
- (viii) Similarity between nucleoproteins of viruses with the protein and nucleic acid of living organisms.

VIRUS- GENERAL TRAITS AND THEIR BIOTIC AND ABIOTIC NATURE

Viruses are non-living because:

- (i) They can be crystallized (Stanley, 1935)
- (ii) They behave as inert chemicals outside the host cell.
- (iii) A cell wall or cell membrane of any type is absent in viruses.
- (iv) They do not show functional autonomy.
- (v) They do not respire or excrete or they do not show any sign of metabolism except reproduction.
- (vi) They lack any energy producing enzyme system.

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