

Difference Between Virus and Virion

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Key Difference - Virus vs Virion

Infections are diseases transmitted by different agents which can be harmful due to the manifestations it brings about. There are different forms of agents which transmit diseases. Microorganisms and infectious agents such as viruses and virions play a major role in disease manifestations. **Virus is a broad, general term for any aspect of the infectious agent which can act as an obligate intracellular parasite, whereas a virion is an infectious particle in the extracellular phase of the host.** This is the **key difference** between virus and virion.

What is a Virus?

A virus can be called as an obligate intracellular parasite. It can only replicate inside a living cell. A virus itself refers to noxious liquids or poison in Latin. Viruses are able to invade and infect the entire population of animals, plants and also microorganisms including bacteria and archaea. A virus is made out of two units namely, an outer protein coat and an inner nucleic acid core. The outer protein coat is known as a capsid which is made of sub units called as capsomeres. The inner nucleic acid core contains either RNA or DNA.

Some viruses have a covering composed of lipids called as an envelope. These are normally gained through cellular membranes such as Golgi, plasma, and nuclear membranes once the virus is matured and budded off from the host cell. Naked viruses lacking a membrane contain the protein coat or the capsid and the nucleic acid together. It is called as the nucleocapsid. These nucleocapsids exist in two different shapes, icosahedral and helical. The pox virus is an example of having a complex nucleocapsid.

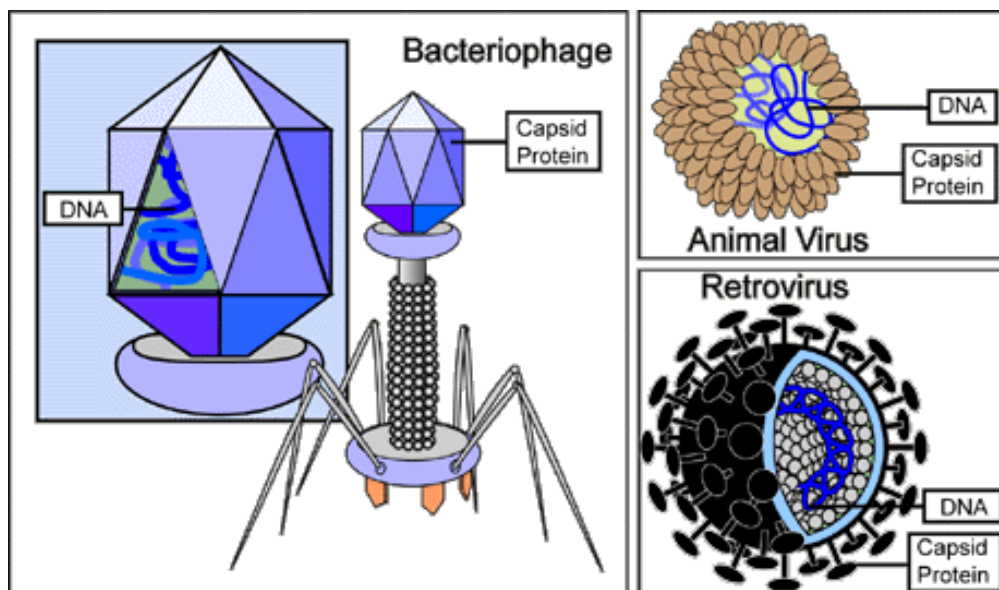


Figure 01: Different types of viruses

The Virus structure contains different types of projections. These projections are mainly glycoproteins. Some are called as spikes where they are thin, long projections while others are peplomers which are wider projections. Coronavirus has peplomer projections which give a similar shape of a clover leaf. The adenovirus contains spike type of projections which are thin and long. Apart from projections, protein coats, envelopes and nucleic acids some viruses also possess other additional structures. For example, Rhabdoviruses consists of a protein lattice called the matrix just below their envelope.

The main protein which composes the matrix is called the M protein and provides rigidity to the virus. The Herpes viruses contains a thick globular layer named tegument underneath their membrane. Viruses do not have the ability to generate energy. But, the main functions of viruses are to deliver or transfer its viral genome into the host cell allowing transcription and translation to take place within the host.

What is a Virion?

A virion can be defined as an infectious form of a virus. It lives on the external surface of a host cell. A virion consists of a protein coat called the capsid as the outer membrane and an inner core which consist of either RNA or DNA. The capsid and the inner core provides specificity and infectivity to the virus respectively. The capsid is developed further by forming a fatty membrane on the outside in some virions. Thus, the virion gets inactivated when it is being exposed to a fat solvent such as chloroform and ether. A virion takes an icosahedral shape as the capsid contains twenty triangular faces.

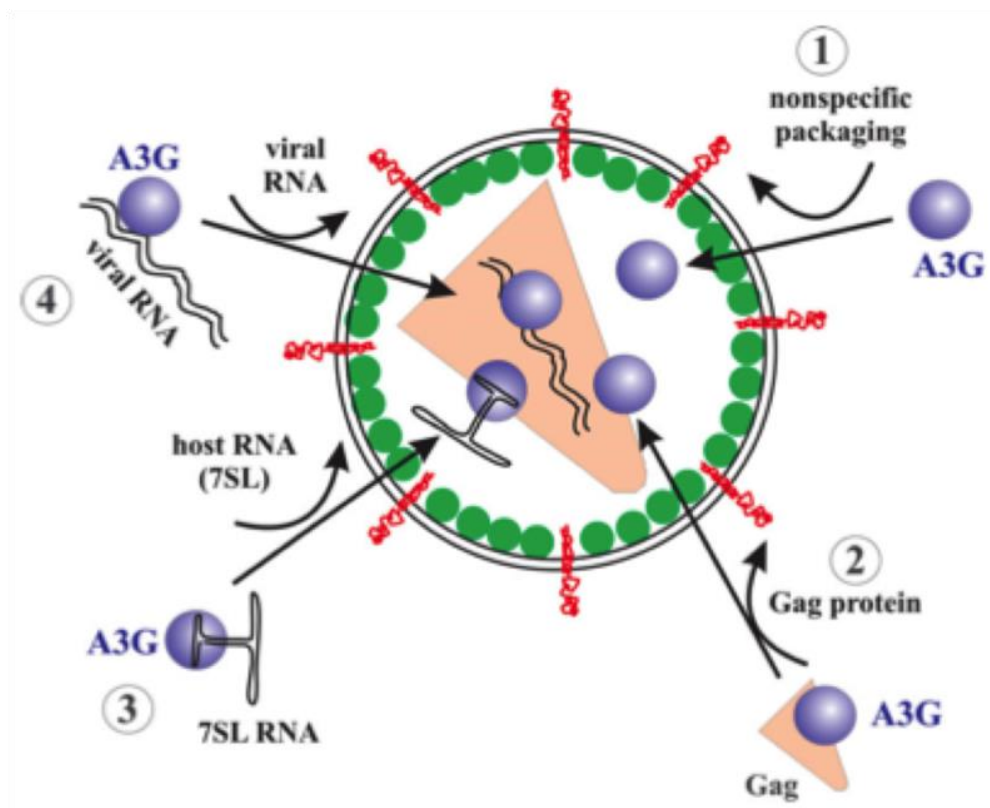


Figure 02: Virion

These triangular faces exist with regularly arranged units called capsomeres. The nucleic acid in the inner core is coiled within these capsomeres. Virions having a capsid which consists of an uneven number of spikes on the surface contain a nucleic acid which is loosely coiled within it. Rod-shaped virions are present on most of the plants where a naked cylindrical shaped capsid containing a straight or helical rod of nucleic acid is present within. The main function of a virion is to assure that the nucleic acid which is viral is delivered from one host cell to another.

Other functions of virions include in protecting the genome from nucleolytic enzymes, genomic delivery, and interaction of viruses along with cells. Virions are known as inert carriers of genomes. They do not have the ability to grow and are not formed through division. Smallpox virus, HIV, Coronavirus, Fluvirion, and Phage-P-22 are few examples of virions.

What are the Similarities Between Virus and Virion?

- Both consist of DNA or RNA
- Both are non cellular, obligatory parasites.
- Both are host specific
- Both are capable of acting as infectious agents.

What is the Difference between Virus and Virion?

Virus vs Viron	
It is an obligatory parasite which is noncellular and self-replicating genetic element consisting of DNA and RNA with no metabolic capability.	They are complete virus particles that are composed of DNA or RNA and are surrounded by protein sheath and act as the vector stage during the infection of one host cell to the next.
Manifestation	
As intracellular parasites	As extracellular infectious particles

Summary - Virus vs Virion

Both viruses and virions are infectious agents responsible for the causation of numerous deadly diseases such as HIV, Ebola, and Mad cow disease. The difference between Virus and Viron is that, Viruses are intracellular obligatory parasites whereas virions reside extracellular. Due to the immense complexity exhibited by these agents, extensive research is carried out to discover their modes of action, their life cycle and the interrelations with hosts.

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How to Cite this Article?

APA: Difference Between Virus and Virion. (2017, October 12). Retrieved (date), from <http://differencebetween.com/difference-between-virus-and-vs-virion/>

MLA: " Difference Between Virus and Virion" Difference Between.Com. 12 October 2017. Web.

Chicago: "Difference Between Virus and Virion." Difference Between.Com. <http://differencebetween.com/difference-between-virus-and-vs-virion/> accessed (accessed [date]).



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