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Viruses have been defined as “ entities whose genomes are elements ofnucleic acid that replicate inside living cells using the cellular syntheticmachinery, and cause the synthesis of specialised elements that can transfer thegenome to other cells.” They are stationaryand are unable to grow.

Because ofall these factors, it is debatable whether viruses are the most complex ofmolecules or the simplest life forms. While the definition of living organismsmust be adapted, the majority of evidence leads to the classification of virusesas living organisms. Viruses are composed of a nucleic acid core, a protein capsid, andoccasionally a membraneous envelope. The nucleic acid core is composed ofeither DNA or in the case of retroviruses, RNA, but never both. In retroviruses, the RNA gets transcribed to DNA bye the enzyme reverse transcriptase. Theprotein capsid is a protein layer that wraps around the virus.

There are fourbasic shapes of viruses. The tobacco mosiac, adenovirus, influenza virus, andt-even bacteriophage are each examples of a different virus structure. Eachindividual protein subunit composing the capsid is a capsomere. The tobacco mosiac virus has a helical capsoid and is rod shaped. Theadenovirus is polyhedral and has a protein spike at each vertex.

The influenzavirus is made of a flexible, helecal capsid. It has an outer membranousenevelope that is covered with glycoprotein spikes. The T-even bacteriophageconsists of a polyhedral head and a tail.

The tail is used to inject DNA into abacterium while the head stores the DNA. Basic life is defined as the simplest form capable of displaying themost

essential attributes of a living thing. This makes the only real criterionfor life the ability to replicate. Only systems containing nucleic acids arecapable of this phenomenon. With this reasoning, a better definition is theunit element of a continuous lineage with an individual evolutionary history. Because of viruses inability to survive when not in a host, they must haveevolved from other forms of life. The origin of viruses is an easy thing totheorize about so many hypothesese have been made.

One such hypothesis is that viruses were once complete living parasites. Over time they have lost all other cellular components. This is backed up bythe idea that all cells degenerate over time. Some people think along very similar lines that viruses arerepresentatives of an early “ nearly living” stage of life. This goes along withthe first hypothesis in that it accounts for a loss of components. Allcreatures that become parasitic can be seen losing their obsolete functions andstructures. An example of this is the flea. Fleas are eveolved from flies buthave discarded their unneeded wings.

This theory when applied suggests that atleast some branches ofviruses have evolved from bacteria because of their similar natures. Scientists say that at one point viruses could have been independantorganisms. As they slowly became parasitic, the unsed structures for proteinand energy synthesis were lost, along with the inhibiting cell wall. Whileviruses do need a host cell to complete many important functions of livingorganisms, the should still be considered living themselves. The ability to replicate is important to the classification of anitem as living. Within the host, viruses are able to replicate, evolve, andeven mutate. They are deeply intertwined in

the life process by thisdependancy on a host. Viruses are very specific to what they can use as a host.

Despitethe specificness, many viruses can host withmembers of different species, genus, and even phylums. A lock and key fit determines the host, or hostrange. This works vert similar to that of an enzymes active site. Once the virus has found a host cell, the virus uses the host’snucleotides and enzymes to replicate it’s DNA. Other materials and machineryof the host cell produce the virus’s capsid proteins. The viral DNA andproteins then join to make a new copy of the virus.

While viruses are inactive when in transport between hosts, thearguements are overwhelmingly in favor of considering viruses living organisms. Through their parasitic nature, they are able to fulfill most qualities ofliving organisms. Their behavior and complexness also lead to thisclassification.

While they are not the text book example of living organisms, is has been in agreement that there always will be exceptions to the rules. Viruses deserve to take their rightful place among the ranks of living organisms.. Category: Science