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Biology 101

Are Viruses Alive?

With the recent coronavirus outbreak there has been a lot of conversation about viruses in the media. Considering the way that a virus spreads and populates hosts with such efficiency and power, the average person would not consider a virus a non-living organism. They may be small, simple, and very different from our idea of what life looks like. However, in this paper we will discuss why viruses are indeed a form of life due to their evolving populations, and their ability to replicate their genes.

If we examine the phylogenetic tree of life with its domains, bacteria, archaea, and eukarya, we see that within each, there are various smaller branches. Viruses follow that same branching pattern with their own taxonomy. For example, this recent pandemic of coronavirus comes from a larger family of coronavirus. It is believed to be related to the SARS virus and the MERS virus (CDC 2020). Viruses are categorized first by the host they infect, then by other factors, such as the nature and shape of their genome, their mechanisms of gene expression, their mechanisms of virus replication, pathology, as well as other distinguishing factors (Pierce 2019).

The fact that viruses have an array of classifications shows that there has been evolution within their populations. When a population adapts over time to their given circumstances it is indicative of life. Just as animals have evolved and adapted over time to their habitats, viruses have evolved and adapted to theirs. This is why there will always be another outbreak of a virus such as the coronavirus. Because viruses adapt to better achieve their purpose to pass on their genes and repopulate, just as any other living creature.

Another quality that indicates that viruses are living entities, is that they have genes which are replicated by the host cell. Viruses can have DNA or RNA in a region in the middle of the virion. Their genetic material ranges in size, shape, and complexity (Joklik & Pierce 2019). The virus is equipped with different proteins that are “useful for the hijacking of host ribosomes” (Al-Shayeb, Sachdeva, & Chen, 2020). Despite the fact that the virus requires a host cell to replicate, the genetic material is still replicated and the virus is able to overtake many cell processes through their replication and protein production.

It is true that viruses don’t do other things that living creatures do, like process their own energy store materials, or reproduce without the help of a host cell. I do not suggest that viruses are in the same category of life as

humans, plants, or bacteria. However despite their simplicity viruses replicate their genes, and evolve over time. These signs of life are not insignificant, they show that viruses are an entity with some level of life inside of them.

Sources

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