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## **Characteristics of living things**

According to Meyer (1970), living organisms have a myriad of similar characteristics. These are as discussed below: The first similarity is their organization. Living things show high levels of organization where multi cellular organisms are sub divided into cells, then organelles, which are further split into molecules, and so on. The second feature of a living thing is homeostasis; which refers to the maintenance of a constant internal environment, in terms of temperature, pH, et cetera. All living creatures must in a way have some mechanism of maintaining themselves in their environments. Another characteristic is the ability to grow and develop.

What happens is that the organisms that are mono-celled grow mostly because; when they are formed during the cell division they are usually small and they are supposed to grow and develop to full-grown cells. Larger organisms grow through organogenesis and differentiation since they are multi-celled. Energy acquisition and discharge is another characteristic of living organisms. Organisms usually attain energy from organic chemicals, sunlight and from other organisms. They release that energy in form of adenosine tri-phosphate. Living organisms need to respond to various stimuli, be they either internal or external.

In addition, living organisms have the need to interact with either the surroundings as well as with other organisms.

## **Characteristics and structures of Viruses, viroids and prions**

Their general characteristics of the above include: they are not made up of cells; they lack the ability to reproduce on their own, do not grow or undergo division and cannot synthesize proteins.

### **Structure and characteristics of viruses**

A virus is basically defined as a non-cellular infectious agent that has got two characteristics; each viral particle consists of a protein coat swathed around a genetic material in addition to a few viral enzymes, it cannot reproduce itself but dupes other cells into making copies of the virus (Starr, Christine and Starr, 2007). A virus comprises of molecular formation that contains nucleic acid that is enclosed by a protein coat.

Viruses are: inseparable by way of bacterial filters, cannot be grown in an artificial media, they produce distinctive symptoms of specific hosts, can be inactivated through chemotherapy or thermotherapy, they are responsive towards temperatures, and they are obligate parasites which lack functional autonomy. The protein coat of a virus contains numerous protein sub-units. There are viruses that have enzymes and many of them are geometric in shapes. The central viral genetic substance could be double-stranded or even single-stranded with either DNA components or RNA components in them.

### **Structure of viroids**

A viroid is defined as an infectious agent, which is much smaller than a virus and is known for affecting higher plants like tomatoes.

Viroids have single-strands of RNA and they do not have protein coat that the viruses contain. A viroid constitutes a very short strand of ribonucleic acid (RNA) that has got no specific coat. Electron microscopic studies have revealed that a mono-strand of RNA molecule contains about 250 to 350 nucleotides. Whereas a virus is described by the existence of a capsid in their formation, viroids on the other hand are characterized by unavailability of the capsid.

### **Structure of prions**

A prion on the other hand is an infectious proteinaceous particle. Prions contain a single protein that is known as PrP and a disease causative agent called beta-pleated sheets that are referred to as prion PrP.

Prions on the other side are composed of a single sialoglycoprotein.

Basically, they have no nucleic acid and have a mass of between 27000 and 30000 Daltons above being composed of 145 amino acids.

### **Different sorts of viruses**

There are approximately 30000 virus types that are being pursued by virologists, however, there could be millions of others existing (Julia & Scott, 2010). Categorization is made difficult due to fossil evidence because they solidify poorly. However there are three common types of viruses; bacterial virus, known as bacteriophage, animal virus and a retrovirus.

### **Diseases caused by prions, viruses and viroids**

A prion is an agent that causes disease which is attributed to various deadly diseases known by the name, transmissible spongiform encephalopathies.

Prions are uncommon proteins that get into the brain causing refold of the normal proteins to into strange shapes that creates holes in the brain.

Some of the common diseases from this particle are: mad cow disease, scrapie, and Jacob's disease (Brauman, 2005). Examples of diseases that are caused by viruses include small pox, common cold, AIDS (caused by HIV) and cold sores that come as a result of herpes simplex. Currently, cervical cancer has been recognized a disease that is caused by papillomavirus, which is also for the development of warts.

Virulence is described as the capacity of the virus to cause a disease.

Shifting focus to viroids, the only human illness caused by viroids is hepatitis D

### **What is Life?**

Life is the phenomenon feature that separates the living organisms from the non-living ones (Mayr, 1998). This definition can help in determining if viruses, viroids and prions are alive or not.

### **Are viruses, prions and viroids alive?**

The question whether viruses are alive or not is hard to determine. They make use of the available enzymes as well as other molecules that fit in the host cell to generate more viruses. They are not unicellular, neither is they multi-cellular organisms but rather, they lie in between the living and the non-living world.

However, they consist of various inherited genes in the replicated particles but the whole development entirely depend n the hoist cells in order to

fabricate the other new generations of viruses. Similar to DNA, they also undergo molecular reproduction and they are also crystallized easily. It's not appropriate to classify viruses as living this due to the fact they depend on the host cells replication.

## References

Meyer, N. 1970.

Biosphere; a study of life. Prentice-Hall, New York. Starr, C., Christine, A and Starr, L. 2007.

Biology: today and tomorrow: with physiology. Cengage Learning, Belmont.

Brauman, R. 2005.

Microbiology. Pearson Education, San Francisco. Mayr, E. 1998. This is biology: the science of the living world.

Harvard University Press, Harvard. Julia, E and Scott, R. 2010. The human genome: a user's guide. Academic Press, San Diego.