Name

Instructor

Course

Date

Life

Biologists and philosophers use the term life to differentiate between a living organism and a lifeless one. In short, they do not use this word to refer to either living or an inanimate object. However, it has been challenging for these researchers to identify a life object. It has been established that life can be a product of non-living molecules as well (Mayr, 2). This has resulted in a controversy on what exactly constitutes a living process. Some scientists claim that a living being was not in any way different from inorganic matter. Others argue that living organisms comprise features that are not present in inanimate matter.

All things that exist on the planet can either be living, non-living, or dead. Again, a non-living organism can either be dead or inert. One of the characteristics of living beings is that they comprise of a cell or cells (Rastogi 123). Organisms that have one cell are said to be unicellular. Those that have numerous cells are considered to be multicellular. These cells are organized to form tissues, which then come together to form organs. Organs form an organ system that ultimately gets held to form an organism. This level of organization does not happen in the nonliving matter since they do not have cells (the smallest unit). Besides, living things contain organic molecules and macromolecules that are not present in non-living objects. Another feature of living beings is that they contain DNA and rarely have RNA. These genetic materials are not present in inorganic matter. Living beings require energy to survive, while the nonorganic case does not require any energy input (Rastogi 123). There are processes that take place in living creatures and are not present in the inert matter; they include ingestion and excretion. Nonetheless, both living and inert organisms are made up of identical elements that integrate to form molecules. Again, they are both controlled by the same physical laws. The basic features that define living organisms include growth, reproduction, homeostasis, and metabolism. These processes help one understand the meaning of life.

As noted earlier, living beings contain single or multiple cells. The chemical composition of the cell explains what exactly constitutes life. The major component of cells is water, which helps chemical reactions to occur by providing an aqueous medium. Accordingly, water plays a key role in the chemistry of life (Rastogi, 126). Other chemical molecules that are present in cells include inorganic ions and both large and small-sized molecules. A large percentage of a living cell is made up of water. Its polarity makes it an effective solvent for many elements found on the earth's crust. Some of the elements found in living beings include sodium, carbon, potassium, oxygen, hydrogen, nitrogen, and calcium (Rastogi 23). These elements are crucial for life and constitute the chemical composition of a cell. The small molecules in a cell combine to form compounds of the large size called macromolecules. Examples of macromolecules are polysaccharides, nucleic acids (DNA and RNA), lipids, and proteins. These four macromolecules are considered to be the building blocks of life.

Carbohydrates (polysaccharides) are the common, occurring organic substances found in both animals and plants. This compound acts as a source of energy in animals and forms a part of the structure of the cell wall in plants. These compounds are made up of more than ten monomer units of monosaccharides (Rastogi 25). The most common polysaccharide in plants is cellulose. Moreover, proteins are believed to be irregular polymers that comprise of more than twenty monomer units of L-amino acids. Proteins perform many functions in the body, including regulating metabolic functions in a cell. Some examples of structural proteins include collagen and keratin. These proteins are fibrous and, thus, are insoluble in body fluids. Besides, enzymes, antibodies, and some hormones are said to be functional proteins and dissolve in body fluids. Cells also contain other structural and functional components called lipids, for instance, fats. These compounds do not form biopolymers and are insoluble in water. This has been ascribed to the long hydrocarbon chains, which are nonpolar (Rastogi 39). Lipids are essential in the body as they help to initiate Physico-chemical functions in cells.

Bodies of living beings consist of many organs, including the brain. The brain is part of the central nervous system and performs several functions in the body. This organ contains both nerve cells (neurons) and glial cells (glia) that enable it to do its functions appropriately. The glial cells facilitate signal propagation, aid in messaging, mediate interactions between brain and bloodstream, and remove dead nerve cells (Ascoli 9). Nerve cells, on the other hand, turn on and off and act collectively to aid in the processing, transmission, and storage of information throughout the body. They also send and receive electrochemical signals. Research has shown that the activity of neurons somehow contributes to humans' inner lives (Ascoli 10). Therefore, neurons are considered as special brain cells.

All living things have cells since they are the building blocks of life. Cells can either be eukaryotic or prokaryotic. Eukaryotic cells have organelles, including a nucleus that is enclosed by a membrane. To be precise, these cells have a cell membrane, nucleus, and cytoplasm, which contains organelles (Favor n.p). Examples of eukaryotes are humans. They are larger and more intricate than prokaryotic cells. On the contrary, prokaryotic cells do not have membrane-bound organelles, and thus the nuclear material swims freely in the cytoplasm. Examples of prokaryotes are bacteria.

A typical cell is too small to be seen with naked eyes. Therefore, microscopes help researchers to study and understand the structure of a cell (Favor n.p). Cells have different parts, each taking part in a specific function. These parts make it possible for the battery to perform their tasks. One part of a cell is the plasma membrane that acts as a boundary between the cell and the external environment. It allows materials to get in and out of the cell (Orchard & Nation 13). It also contains both proteins and lipids. The internal environment of a cell contains several molecules that are involved in different functions, including digestion, storage of genetic material, and excretion. Another component of the cell is the nucleus, which can either have an envelope or not. The nucleus contains chromatin and nucleolus. The chromatin encompasses DNA material which undergoes transcription to produce messenger RNA. Consequently, the nucleus plays a role in separating genetic material from the rest of the cell, besides regulating protein synthesis (Orchard & Nation 18). The cytoplasm contains endoplasmic reticulum, which helps in lipid and protein synthesis. The proteins synthesized are then sorted by the Golgi apparatus, which determines their fate. Other structures that are found in the nucleus are ribosomes that provide a site for protein synthesis.

Most organisms with multiple cells have tissues that result from the aggregation of similar cells. The tissues formed usually perform specialized functions in the body (Rastogi 127). The next level of organization is the formation of organs. These are made when several tissues combine and form an organ that performs a specific task. Several organs also aggregate to make an organ system that carries out a certain major function. When organ systems come together, they constitute an organism to execute life activities (Rastogi 127). A human being can be used as an example to denote an organism's level of organization.

All organisms have DNA which plays a role in storing genetic information. It is a double-helical structure with four nucleotides arranged in linear order. This nucleic acid is vital for development as it encodes all the necessary information. The DNA comprises of aromatic bases, phosphate groups, as well as ribose sugars (Sinden 3). The structural difference between the bases and sugars gives rise to the helical structure. The death of an organism occurs when all mechanisms that transpire in a cell stops working. However, there is no proven biological reason to explain this phenomenon. Biologists try to understand death by studying various aspects of aging and dying. Death caused by aging is considered to be natural. On the other hand, there are unnatural causes of death, including injury, disease, and accident (V. Rastogi 145). Death is an intrinsic component of the life cycle of an organism. It can be reasoned that death marks the end of life. A human being can die a clinical death or biological one. In clinical death, body cells remain alive for some hours and, hence, removal of tissues and organs for transplantation are possible. Furthermore, brain cells take the longest time to die.

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