Biology

The human being always thrives for better and improved physical and economical standards of living. Our ancestors were using crude techniques to achieve the same. And, currently we are using sophisticated techniques based on scientific principles for healthy future. Biology is the science of life. The process of using this science of life is a tool to change our future in all walks of life.

A Cell

A fundamental unit of life of all living creatures is a cell. The study of cells is referred as ‘ Cell biology. Although a basic biochemical machinery of all living things is stable, it is still dynamic complex system. All living things are composed of one (unicellular) or more (multicellular) cells. All the cells gather energy and utilize energy for growth, reproduction, repairing processes etc. Many different types of cells perform different jobs and together co-ordinate and keep living beings alive. Unicellular (one celled) organisms are bacteria and paramecium, while fungi, plants and animals are multicellular (many cells). The living things are classified into prokaryotes and eukaryotes. Bacterial cells are prokaryotes with simple structure without complex organelle system. Figure 1. A (1) shows prokaryotic cell structure of unicellular bacteria and Figure 1. B shows many bacterial cells. Bacteria are the smallest organism on our planet.

Figure 1. A Figure 1. B Many bacterial cells

Plant cells (Figure 2) (2) form plants. Animal cells (Figure 3) (3) form animals. The plants and animal cells are eukaryotes having larger size than eukaryotes and have complex organelle system. Cells put together form tissues. Tissues form organs. The organs put together form organ system.

The organ systems put together make plants and animals.

Figure 2

Figure 3

Cell DNA

The organelle nucleus in the eukaryotic cell accommodates deoxyribose nucleic acid (DNA) which is a blueprint of our life. The DNA houses the intelligence needed to determine the characteristic shape (structure) and job (function) of all living creatures. We get this DNA from our parents which decides our physical make up, our intelligence, and it reflects our personality. DNA of a cell decides the characteristic role of that cell it has to play in our body. This double helix DNA is like a spiral staircase. DNA can be extracted from any living things and can be seen in a test tube with naked eye in the form of long ropy strings. This DNA is made up of four nucleotides A, T, C and G (Figure 4) (4). The various permutations and combinations of these nucleotides differentiate each living being. It decides who and how we should be. The human beings have more than three billion nucleotides per cell. We consume 55, 000, 000 cells or about 93, 205 miles of DNA per meal (5). A particular order of these nucleotides (A, T, C and G) / letters called a sequence deliver a particular instruction. These four letters are miracle

alphabets controlling our body.

Figure 4

The set of information on the DNA helps to make various proteins in the body. The protein molecules are composed of different amino acid. The aminoacid arrangement decides folding of the protein and thereby ascertaining various properties to a particular protein molecule. The structural proteins form framework of muscles, connective tissue, hair etc. The enzyme proteins enhance the rate of biochemical reactions in our body. The antibodies are proteins which fight with the foreign substance/ invader who attacks our body. A part of the DNA which regulates a particular protein production is referred as ‘ gene’. Thus, diverse variety of life can be created by manipulating code words of DNA. The human genome is an instruction manual or complete map of our body.

References

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