



The Role of Variations and Heredity in Human Existence

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ARTICLE HISTORY

Received: 03-Jan-2022, Manuscript No. JCMEDU-22-52477;

Editor assigned: 05-Jan-2022, PreQC No. JCMEDU-22-52477 (PQ);

Reviewed: 19-Jan-2022, QC No. JCMEDU-22-52477;

Revised: 24-Jan-2022, Manuscript No. JCMEDU-22-52477 (R);

Published: 31-Jan-2022.

Description

The study of character transmission from one generation to the next is known as heredity. Heredity, often known as inheritance or biological inheritance, is the process of passing on features from parents to their children. Asexual or sexual reproduction allows progeny cells or organisms to inherit their parents' genetic information. Variations can be passed down over the generations, causing species to evolve through natural selection. Genetics is the study of heredity in biology. The characters that are passed from one generation to the other are called hereditary characters. Variations on the other hand may be defined as the differences in characteristics shown by the individuals of a species and also by the progeny of the same parents.

However, the modern science of genetics, which seeks to understand the process of inheritance, only began with the work of Gregor Mendel. Although he did not know the physical basis for heredity, Mendel observed that organisms inherit traits via distinct units of inheritance, which are now called genes. After the rediscovery of Mendel's work by de Vries, Correns and Tschermak, scientists tried to determine which molecules in the cell were responsible for inheritance. Chromosomal Theory of Inheritance or the Sutton-Boveri Theory is a fundamental unifying theory of genetics which identifies chromosomes, which are seen in all dividing cells and pass from one generation to the next, are the basis for all genetic inheritance. Eye colour is an inherited characteristic in humans; a person may receive the "brown-eye trait" from one of their parents. Genes regulate inherited traits, and an organism's genotype refers to the entire

set of genes contained within its genome. The entire set of observable qualities of an organism's structure and behaviour is considered to as its phenotype. These characteristics are the result of the genotype's interaction with the environment. As a result, many characteristics of an organism's phenotypic are not passed down from generation to generation. Sun-tanned skin, for example, is the result of a person's genotype interacting with sunshine; consequently, suntans are not handed down to children. Some people, however, tan more easily than others because to genetic differences: those with the inherited feature of albinism, for example, do not tan at all and are extremely vulnerable to sunburn.

DNA, a molecule that encodes genetic information, is known to pass heritable qualities from one generation to the next. DNA is a long polymer composed of 4 different bases, which are interchangeable. The genetic information is specified by the nucleic acid sequence, which is similar to a series of letters spelling out a passage of text. The DNA of a cell is replicated before it splits by mitosis, so that each of the ensuing two cells inherits the DNA sequence. A gene is a segment of a DNA molecule that determines a single functional unit; different genes have distinct base sequences. Chromosomes are condensed structures made up of long strands of DNA found within cells. Homologous chromosomes, which contain a unique combination of DNA sequences that code for genes, are inherited by organisms from their parents. A locus is the precise position of a DNA sequence within a chromosome. Alleles are various versions of a DNA sequence that differ between individuals at a specific locus. DNA sequences can change through mutations, producing new alleles.