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ISSN: 2329-6682
Gene Technology

Perspective

Short Note on Genetic Variation

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DESCRIPTION

Genetic variant refers to range in gene frequencies. Genetic variant can talk over with variations among people or to variations among populations. Mutation is the last supply of genetic variant, however mechanisms including sexual replica and genetic drift contribution to it as well.

Evolutionary biologists are regularly involved with genetic version, a time period which in contemporary-day instances has come to consult variations in DNA sequences among individuals. However, quantifying and comprehensive genetic version has been an imperative goal of these interested by expertise the various lifestyles on this planet considering that lengthy earlier than the sequencing of the primary complete genome, or even earlier than the invention of DNA because the molecule chargeable for heredity.

While today`s definition of genetic variation is based on current molecular genetics, the concept of heritable version turned into more significant to the ones interested by the substance and improvement of lifestyles even earlier than the writings of Charles Darwin. The idea of heritable variation turned into the presence of innate variations among lifestyles which are exceeded from mother and father to offspring, in particular inside classes which includes species does now no longer depend on present day thoughts of genetics, which had been unavailable to 18th and 19th century minds.

Gene duplication, mutations, or other processes can generate new genes or alleles and increase genetic variation. High-fertility populations may have high levels of genetic variation because new genetic variations can be created within generations, within the population. However, existing genes can be rearranged in new ways by crossover and recombination of chromosomes during sexual reproduction. Overall, the main causes of genetic variation are the formation of new alleles, changes in the number or location of genes, rapid reproduction, and sexual reproduction.

Genetic variation is primarily caused by DNA mutations, gene flow (transfer of genes from one population to another), and sexual reproduction. Due to the fact that the environment is unstable, genetically variable populations can adapt better to changing circumstances than populations without genetic variation.

DNA mutation

The sudden change of the DNA sequence is called mutation. These changes in gene sequences can be beneficial to an organism. Most mutations that lead to genetic variation produce traits that give neither strengths nor weaknesses. Mutations produce genetic variation by altering genes and alleles within a population. They can affect a single gene or the entire chromosome. Mutations change the genotype of an organism, but do not necessarily change the phenotype of the organism.

Gene flow

Gene flow also known as gene transfer, introduces new genes into a population as an organism moves into a new environment. The availability of new alleles in the gene pool allows for new combinations of genes. The frequency of genes can also change with the movement of organisms from the population. The migration of new organisms to a population can help them adapt better to changing environmental conditions. The migration of organisms from a population can result in a lack of genetic diversity.

Sexual reproduction

Sexual reproduction promotes genetic variation by producing different combinations of genes. Meiosis is the process by which sex cells or gametes are formed. Genetic variation occurs when alleles are isolated in gametes and randomly bound during fertilization. Genetic recombination of genes also occurs during crossover of homologous chromosomes or exchange of gene segments during meiosis.

If all individuals of a species are genetically identical, they will be susceptible to the same disease. In this case, one disease can wipe out the entire species.

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Received: 01-Feb-2022, Manuscript No. RDT-22-16118; **Editor assigned:** 03-Feb-2022, PreQC No. RDT-22-16118 (PQ); **Reviewed:** 17-Feb-2022, QC No. RDT-22-16118; **Revised:** 21-Feb-2022, Manuscript No. RDT-22-16118 (R); **Published:** 28-Feb-2022, DOI: 10.35248/2329-6682.22.11.181.

Citation: Weiss M (2022) Short Note on Genetic Variation. Gene Technol. 11:181.

Due to those genes, some individuals of some species may have better camouflage or may be able to run faster. These people are more likely to survive. This is called survival of the fittest.

The surviving members of the species can breed. Their offspring may have the desired characteristics of their parents. This is the evolutionary change of the species.

Finally, genetic variant may be an end result of sexual reproduction, which results in the advent of recent mixtures of genes. Genetic variant in a set of organisms allows few organisms to live on higher than others with inside the surroundings wherein they live.