

Gene Mutation Encyclopedia Article

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Gene Mutation

Gene mutation is a sudden change in the DNA making up an individual gene. Gene mutation is a fairly infrequent event, although its occurrence can be speeded up by the action of radiation or of certain chemicals (termed mutagens). Within a gene, the most common form of mutation is a single change in one of the bases on the DNA chain. Because of the redundancy of the genetic code, the resulting new codon may still code for the same amino acid. This is a neutral mutation. There is no observable effect on the product. With certain changes, a different amino acid is the result of an alteration in the genetic code. This new amino acid in the gene product may have a profound affect on the shape or functioning of the polypeptide; this is now a new allele of the original gene. In some instances, these mutations are in key components of the gene, and hence the polypeptide, and these forms are potentially non-functioning. Where a gene mutation is functional, it may produce a product slightly different to the original type. It is this difference in functionality that is then acted upon by natural selection. Mutation is the raw material of evolution. Any mutation, no matter how beneficial, will be short lived if it is unable to be passed on to the next generation. Consequently, the only gene mutations that are of any evolutionary consequence are those that are heritable, that is those which occur in the gametes or the gamete precursors.