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# Major Role of Genetic Factors and Genetic Disorders in DNA Sequence Molecule

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## DESCRIPTION

Genetic factors play a role in almost all health conditions and characteristics, there are some conditions where genetic changes are almost entirely responsible for the condition. Because genes are passed down from generation to generation, any changes to the DNA within a gene are also passed down. DNA changes can also occur spontaneously, manifesting themselves for the first time in the child of unaffected parents. This change can occasionally result in errors in the protein instructions, resulting in the production of a protein that does not function properly or cannot be produced at all. When one protein is missing or not functioning properly, it can result in a genetic disorder. Each disorder has its own genetics. In some cases, all of the errors in a single gene result in a single genetic disorder. In other cases, different changes within the same gene can cause a variety of health or developmental issues, as well as genetic disorders. Changes in several similar genes can sometimes result in the same genetic disorder.

Genetic disorders are typically inherited (passed down) in one of two ways: dominant or recessive. On each of our 22 numbered chromosomes, we have two copies of every gene. Furthermore, females have two copies of all X chromosome genes, whereas males have one copy of the X chromosome genes and one copy of the Y chromosome genes. When a disorder is dominant, the disease can occur when only one of the two gene copies has a mistake in its DNA. This means that if a parent has the DNA change, each child has a 50-50 chance of inheriting it. When a disorder is recessive; the disorder must be caused by errors in both copies of the gene. This means that in order to have an affected child, both parents must have at least one copy of the specific gene change.

Genetic disorders can also be complex, multifactorial, or polygenic, which means they are likely caused by the interactions of multiple genes with lifestyle and environmental factors. Heart disease and diabetes are examples of multifactorial disorders. Although complex disorders frequently cluster in families, there is no clear pattern of inheritance. This makes determining a person's risk of inheriting or passing on these disorders difficult. Complex disorders are also difficult to study and treat because the underlying causes of the majority of these disorders have yet to be identified. Several methodological approaches can be used to determine genotype-phenotype associations in studies aiming to identify the cause of complex disorders. The genotype-first approach begins by identifying genetic variants within patients and then determining the clinical manifestations associated with those variants. In contrast to the more traditional phenotype-first approach, this method may uncover causal factors that were previously obscured by clinical heterogeneity, penetrance, and expressivity. It has been observed that heritable traits are passed down from generation to generation *via* DNA a molecule that encodes genetic information. DNA is a long polymer that contains four interchangeable types of bases. The genetic information is specified by the nucleic acid sequence (the sequence of bases along a specific DNA molecule), which is analogous to a sequence of letters spelling out a passage of text. DNA is copied before a cell divides during mitosis, so that each of the resulting two cells inherits the DNA sequence. A gene is a portion of a DNA molecule that specifies a single functional unit different gene have different base sequences.

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