

# What is a Gene Mutation and how do mutations occur?

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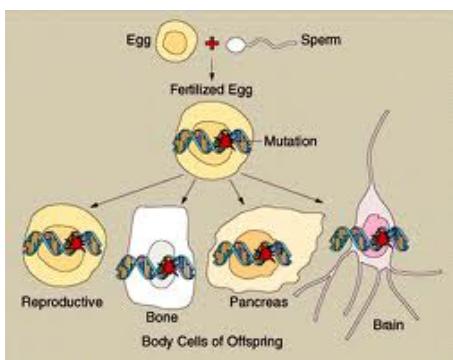
## Gene Mutation



- A permanent change in the DNA sequence that makes up a gene.
- Mutations range in size from a single DNA building block (DNA base) to a large segment of a chromosome.

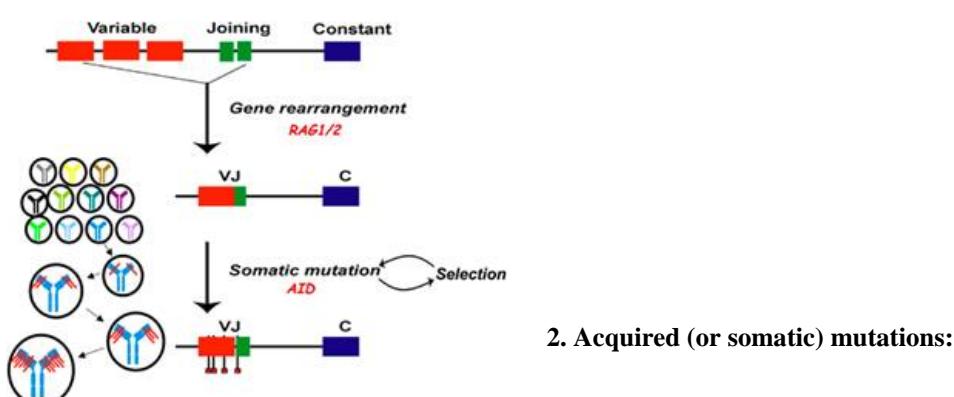
### Gene mutations occur in two ways:

They can be inherited from a parent as a hereditary mutation or acquired during a person's lifetime.



#### 1. Hereditary Mutations:

Mutations that are inherited from parent to child are known as hereditary mutations. It also named as germline mutations. Because, it occurs in the germ cells only. It retains throughout a person's lifetime.



#### 2. Acquired (or somatic) mutations:

It occurs in the DNA at times during a person's life. Environmental factors such as UV radiation from the sun errors in DNA

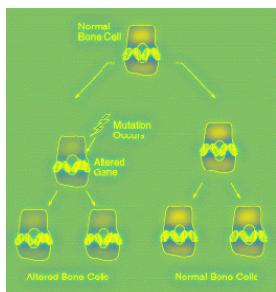
copies are the causes of these mutations. Acquired mutations occur in somatic cells so it cannot be passed on to the next generation.

### Single cell Mutations:

Mutations occur in a single cell within an embryo. During cell division the individual will have some mutated cells and some cells without the genetic change. This is known as mosaicism.

## Genetic Changes

Polymorphisms are the genetic changes occur in more than 1% of the population. As it is common it is identified as the normal variation of the DNA. Eye color, hair color, and blood type are the normal differences occur in organisms because of the polymorphisms. It won't end up with any negative effect but at times it may influence some disorders.

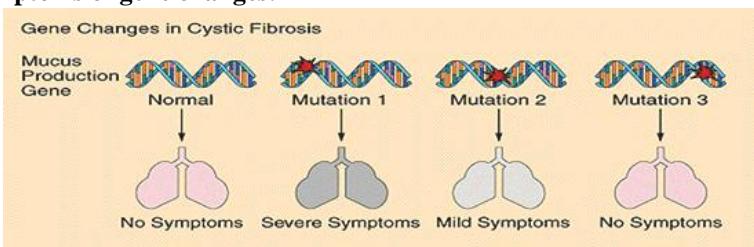


### How can gene mutations affect health and development?

All cells depend on thousands of proteins for the various functions. Sometimes, these gene mutations prevent the working of some proteins end up in malfunction of the protein which leads to some mutations. Mutation alters some proteins and the normal development would be disturbed. This is termed as genetic disorder.

Gene mutations sometimes restrict the growth of embryo and the development of the embryo would get disturbed or restricted. The growth of the embryo would be restricted in the early stages of growth because of the serious effects of mutations.

### Symptoms of gene changes:



Genes themselves never cause disease and always the

genetic disorders induced by mutations only. For example, in the disease “the cystic fibrosis gene,” occurs because of the mutated version of the CFTR gene only. All of us are having a CFTR gene including those without cystic fibrosis.

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