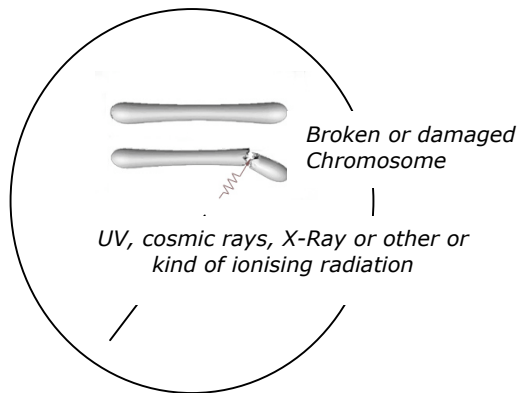


# Mutations

A change in the genetic composition of an organism

## Chromosomal Mutations

Caused by various damages to the structure of a chromosome; often caused by a toxic chemical or radiation particle



## Point Mutations

A point mutation is one in which a single pair of nucleotides in a certain **point** in the DNA is replaced by a different base pair

SUBSTITUTION

DELETION

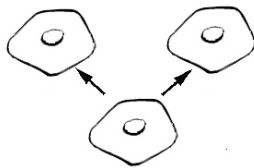
INSERTIONS

A **Silent mutation** is one in which no noticeable change occurs

In **Missense mutations**, the new nucleotide alters the codon affecting the sequence of amino acids and possible shape of functions of a protein

**Nonsense mutations** generate stop codons.

MUTATIONS CAN OCCUR IN SOMATIC OR IN REPRODUCTIVE CELLS



## Somatic Mutations

Occur in **somatic cell**, such as those in the skin, kidney or bone marrow. Some somatic mutations may damage or kill the cell, some convert it into a tumor cell that can become cancerous. When the cell goes through mitotic divisions, the mutation is transferred to all offspring of the mutated cell within the same tissue or organ. Cancer cells spread metastasis of mutated cells throughout the body.

**Somatic mutations** vanish when the cells that carry them die, or when tumor cells are killed.



## Germline Mutations

Take place in **eggs or sperms** of an individual organism. They are called germline because they can be passed to the zygote from which a new organism will be developed. This new organism will carry such a mutation in every one of its cells, both reproductive (eggs, sperms) and somatic.

The next generation of gametes will carry the mutation so it will be passed down to the next generation and so on...