

# GENETIC MUTATIONS

Types of genetic mutation known to lead to cancer include:

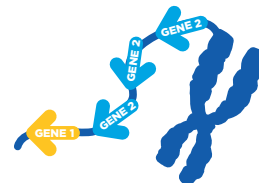
## Single base changes

Deletion or insertion of a single base can result in new proteins, altered versions of normal proteins, or loss of protein function, which can lead to cancer.



## Extra copies of genes (gene amplification)

Higher quantities of certain proteins can result in enhanced cell survival and growth, leading to cancer.



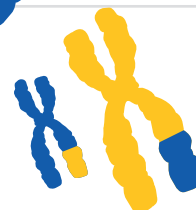
## Deletions

Loss of DNA can result in loss of genes necessary to regulate the processes that control normal cell growth, division, and life span, leading to cancer development.



## Structural variation

Exchange of DNA between chromosomes can alter multiple genes at once. It can sometimes lead to the fusion of two separate genes, generating entirely new proteins that can drive the development of cancer.



## Mutations that alter the epigenome

Several proteins read, write, or erase epigenetic marks on DNA or the histones around which DNA is packaged. Mutations in the genes that produce these proteins can lead to cancer by altering the coordinated activation or silencing of genes needed to control cell growth and division processes.



Of note, cells acquire mutations over time but not all mutations cause cancer. In addition, not all mutations found in a cancer cell contribute to cancer development.

Adapted from (1)