Mutations

A mutation is the permanent alteration of the nucleotide sequence of the genome of an organism. When this alteration involve one nucleotide, it is called point mutation: A point mutation that changes a purine nucleotide to another purine (A ↔ G) or a pyrimidine nucleotide to another pyrimidine (C ↔ T) is called transition.

Transversions are interchanges of purine for pyrimidine bases, which therefore involve exchange of one-ring and two-ring structures.

According to the results, mutation is classified into

1. Silent mutation: The codon containing the changed bases may code for the same amino acid. For example, if the serine codon UCA is given a different third base “U” to become UCU, it still codes for serine. This is termed a “silent” mutation.

2. Missense mutation: The codon containing the changed bases may code for a different amino acid. For example, if the serine codon UCA is given a different first base “C” to become CCA, it will code for a different amino acid, in this case, proline.

3- Nonsense mutation: The codon containing the changed bases may become a termination codon. For example, if the serine codon UCA is given a different second base “A” to become UAA, the new codon causes termination of translation at that point and the production of a shortened (truncated) protein.

A frameshift mutation caused by insert or delete of number of nucleotide from a DNA sequence. This number of nucleotides that is not divisible by three.

So, there are two types of this mutation:

A- Insertion

B- Deletion

If three nucleotides are added, a new amino acid is added to the peptide, or if three nucleotides are deleted, an amino acid is lost.

In these instances, the reading frame is not affected. Loss of three nucleotides maintains the reading frame but can result in serious pathology.