# DEPURINATION AND DEPYRIMIDATION

Depurination is the loss of purine due to breaking of glyosidic bond of nucleotides in DNA.

Similarly, depyrimidation is the loss of pyrimidine base.

Depurination and depyrimidation are more common at acidic pH. However, these process can also occur at appreciable rate at neutral or alkaline pH.

Pyrimidine nucleosides are considerably more stable than purine nucleosides with respect to the glycosidic bond of the bases to deoxyribose.

The mechanism of depyrimidation is the same as for depurination, but cytosine and thymine are lost at lost at a rate only 1/20 of that for adenine or guanine.

# DEAMINATION

- Deamination is the removal of an amino group from a molecules. Three of the four nitrogenous bases normally present in DNA (cytosine, adenine and guanine) contain exocyclic group.
- Deamination of cytosine result in the formation of uracil.
- Similarly deamination of adenine and guanine result in the formation of hypoxanthine and xanthine respectively.
- Deamination of 5 methylcytosine gives thymine.
- Deamination changes the standard base pairing patterns.
- For examples, xanthine results from the deamination of guanine selectively base pair with thymine instead of cytosine.
- Hypoxanthine selectively base pair with cytosine instead of thymine.

# TRANSPOSITION

- A transposon is DNA sequence that is able to insert (or a copy of itself) at a new location in the genome without having any sequence relationship with the target locus.
- Insertion of a transposable elements into or near a functional gene can alter it expression by causing loss of gene function or by changing the gene's expression (insertion mutation).

# THANK YOU

# COURSE - MUTATION

## MOLECULAR BASIS OF GENE MUTATION

## (Spontaneous mutation part-3)

BY- NASIMA FIRDAUS

## Spontaneous lesion

- Naturally occurring damage to the DNA, is called spontaneous lesions, also can generate mutations.
- Deamination
- Depurination and depyrimidination
- Oxidative damage

Two of the most frequent spontaneous lesions are Depurination and Deamination

- The former being more common.

.

## OXIDATIVE DAMAGE

- Besides, deamination and depurination/ depyrimidation, attack by reactive oxygen species, must be considered as a major source of spontaneous damage to DNA.
- Radicals (like superoxide radicals, hydrogen peroxide and hydroxyl radicals), attack on DNA can produce a variety of products.
- 8- oxo-7 hydrodeoxyguanosine (8-oxo-dG) and thymidine glycol are products of oxidative damage.
- The 8-oxodG mis pair with A, resulting in high level of G - T transversions.
- Thymidine glycol blocks DNA replication.