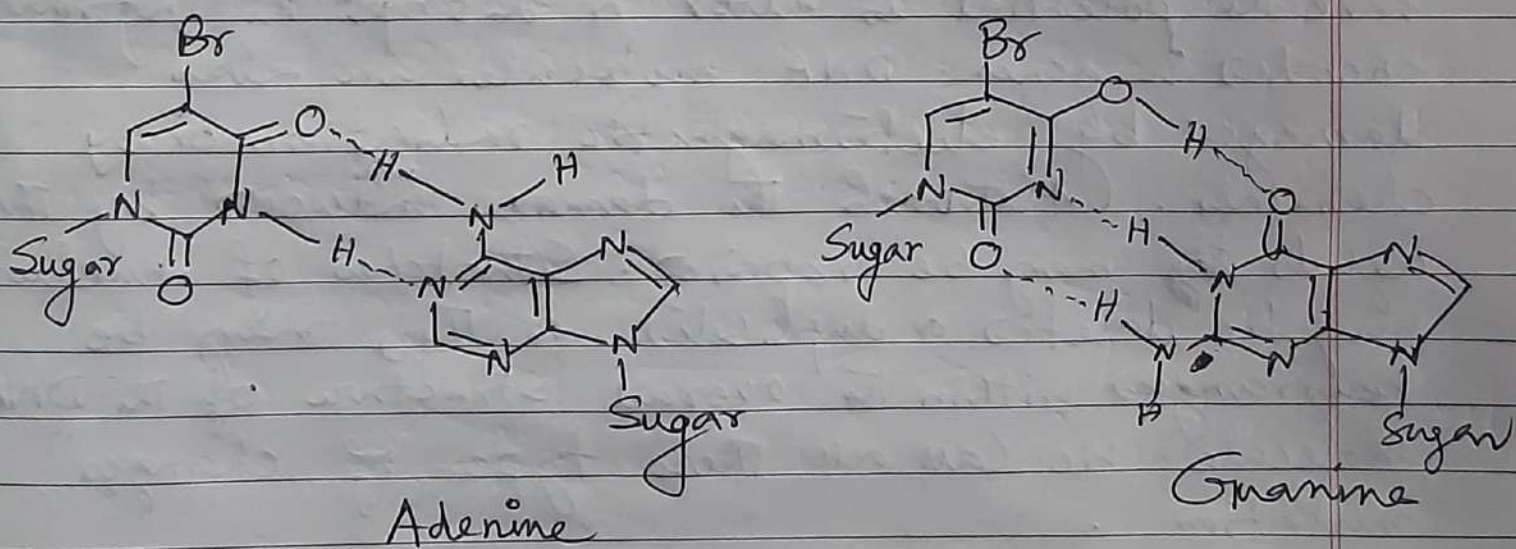
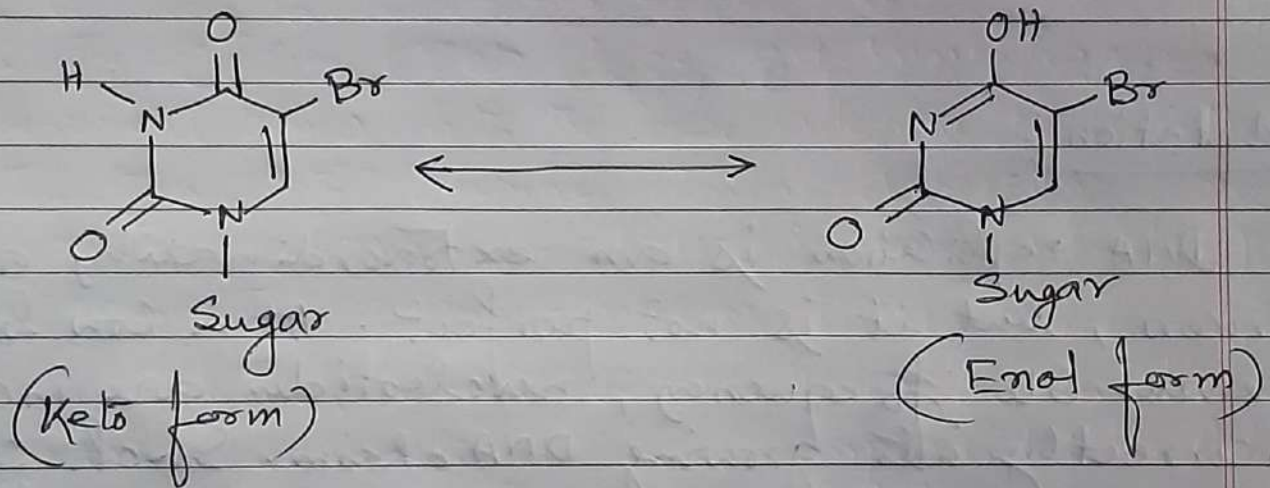


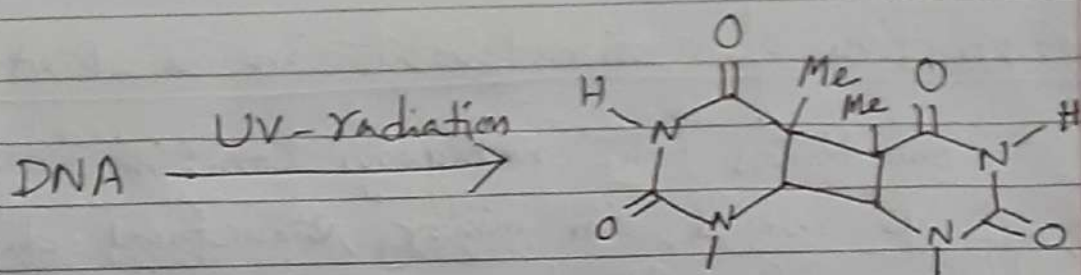
## \* Incorporation of antimetabolite in the DNA-chain :-

Sometimes, the mutagens combine with DNA itself to result in minor structural differences in the double helix structure. For example, adenine forms H-bonding with counter base uracil in its keto form, but guanine interacts with the enol form of 5-bromouracil. This slight difference in the Watson-Crick base pairing mechanism causes errors in the transmission of genetic information. Thus, 5-bromouracil or 5-fluorouracil may be considered as an antimetabolite to the metabolite uracil.



Mutagenic activity of 5-bromouracil





## UV-radiation induced dimerisation

There are some other reasons like free radical attack, alkyl of DNA, intercalation of some compounds in DNA helix, chromosomal aberrations, interaction of metal ions with DNA.

## Mutation:-

DNA replication is an extraordinarily accurate process, but it is not perfect. At a low but measurable frequency, nucleotides are incorporated incorrectly into growing DNA chains. Such changes have the potential to alter or disrupt the information encoded in genes. DNA molecules are also damaged by electromagnetic radiation or by chemicals. Although the damage induced by these agents ~~may~~ may be repaired. Stretches of nucleotides may be deleted or duplicated, or they may be rearranged within the overall structure of the DNA molecule. We call all these types of changes mutation.

So, mutation is the process by which the sequence of base pairs in a DNA molecule is altered. A mutation ~~is~~ is a change in a either DNA base



pair or a ~~chromosome~~ chromosome. A cell with a mutation is a mutant cell. If a mutation happens to occur in a multicellular organism, the mutant characteristics affects only the individual in which the mutation occurs and not passed on to the succeeding generation. This type of mutation is called somatic mutation. In contrast, the mutations in the germline sexually reproducing organisms may be transmitted by the ~~germ~~ gametes to the next generation. Such mutations are called germ-line mutation.

Two different terms are used to give a quantitative measure of the occurrence of mutations. The mutation rate is the probability of a particular kind of mutation as a function of time, such as number of mutations per nucleotide pair per generation or the number of genes per generation. The mutation frequency is the number of occurrence of a particular kind of mutation, expressed as the proportion of cells or individuals in a population, such as the number of mutations per 100000 organisms or the number per 1 million gametes.

### Types of point mutation:-

Point mutations are those mutations which change only one or a few base pair. It can be divided into two general categories.

- 1) Base pair Substitutions
- 2) Base pair insertions or deletions.