



Umm AL Qura University

# DNA-REPAIR

# DNA-REPAIR MECHANISMS

- DNA-repair mechanisms exist to **correct DNA damage** due to:
  1. Environmental mutagens.
  2. **Accidental base misincorporation** at the time of **DNA replication**.



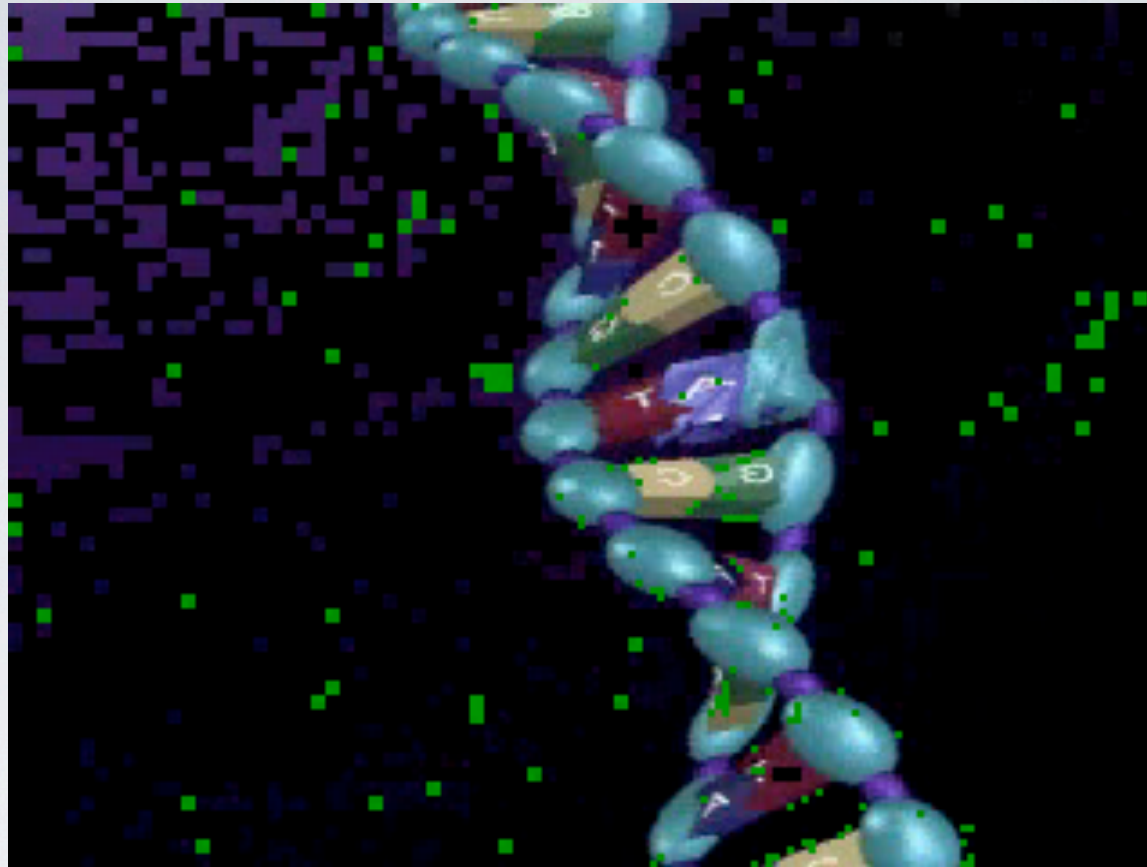
# DNA-REPAIR MECHANISMS

- There are four different types of DNA-repair mechanisms:
  - Excision repair
  - Mismatch repair
  - Recombination repair system
  - Double-strand repair

# EXCISION REPAIR SYSTEM

- The process starts by the action of exonuclease which **cleaves the damage strand at two sites** (**27 nucleotides before** the damaged site and **29 nucleotides after** the damaged site) and removed
- **Then, DNA synthesis will restore** the missing strand and DNA ligase close the gap.





## DNA repair



HHMI

# Mismatch Repair

# DNA Repair

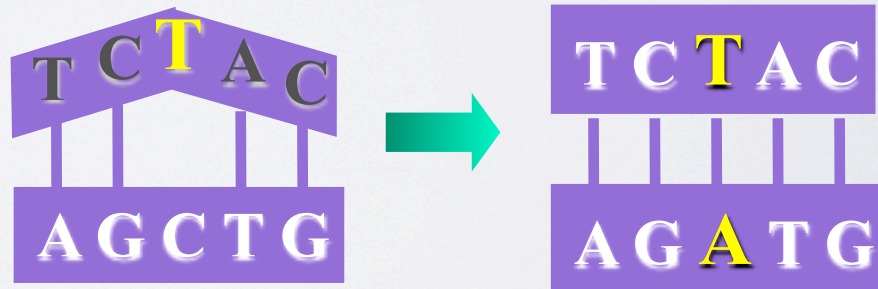
Base pair mismatch



Normal DNA repair



Mutation introduced by unrepaired DNA





# Mismatch Repair Failure Leads to Microsatellite Instability (MSI)

Normal



Microsatellite  
instability



Addition of  
nucleotide  
repeats