

# Causes of Mutations

- Some mutations occur spontaneously
  - *Example: point mutations*
  - Sometimes during DNA replication, polymerase adds the wrong base
  - It becomes the wrong base in a 100,000 base sequence
  - This means it could cause problems – or it might not

# Causes of Mutations

- Certain chemicals and radiation can cause mutations
- **Mutagens** – substances that cause mutations
  - can affect DNA by changing the structure of the bases
  - Causes bases to pair incorrectly or bond with the wrong base
- Some mutagens substitute for bases
  - Once in the DNA, the DNA can't copy correctly
  - Not always a bad thing – used to treat HIV/AIDS

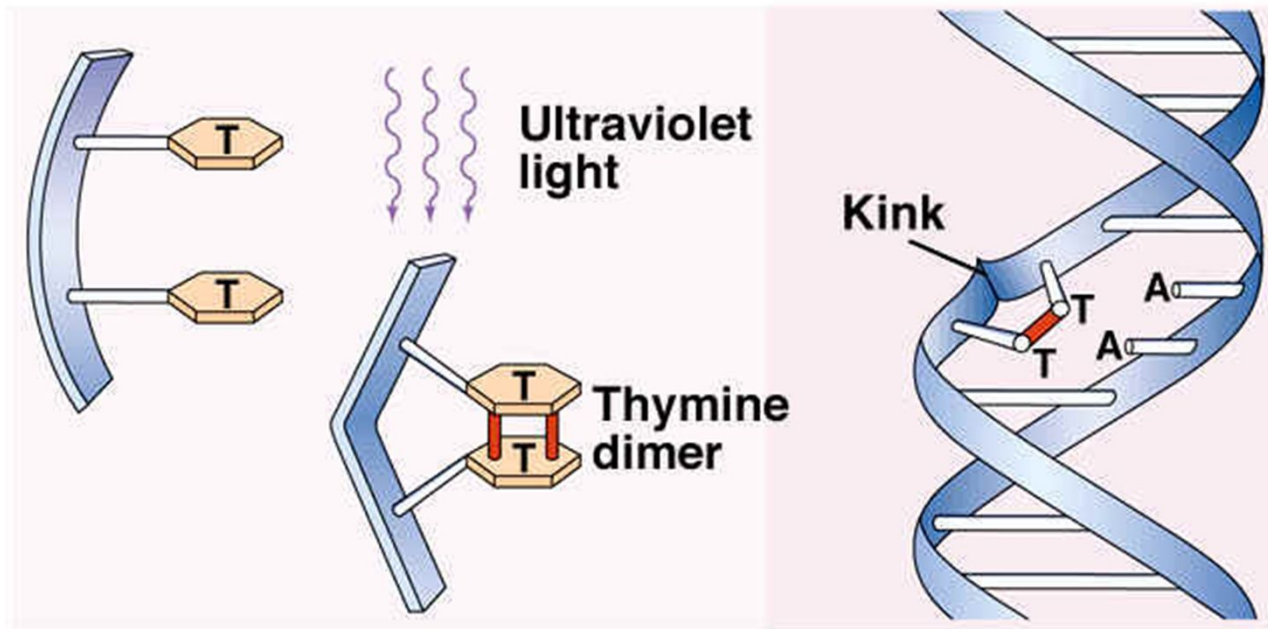
# Causes of Mutations

- High energy forms of radiation like X rays and gamma rays
  - Radiation reaches the DNA and electrons absorb the energy
  - This creates molecules that react violently with DNA
  - UV radiation from the Sun affects thymine bases
    - Causes them to bind together – changing the structure of DNA
    - DNA cannot copy correctly with wrong structure

# Causes of Mutations

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## Pyrimidine Dimer



# Body Cell vs Sex Cell Mutations

## ■ Body Cell

- Becomes part of the sequence in that cell and daughter cells
- Not passed on to future generations
- Sometimes there are no problems
- If a problem – could cause cell death (apoptosis)

## ■ Sex Cell

- Passed on to offspring
- Will be present in every cell of the offspring
- Might not affect the parent, but most likely will affect the offspring