

CONCEPT: DNA REPAIR

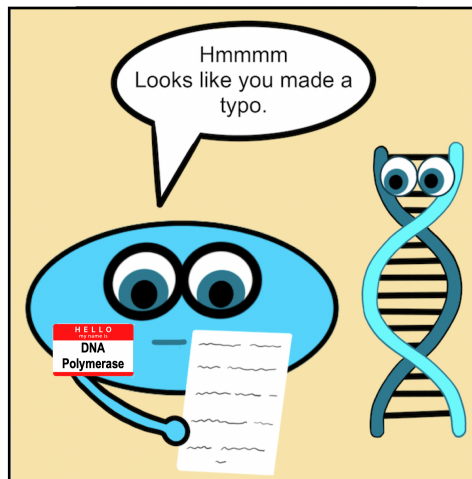
- DNA replication is _____ always a perfect process; base-pairing errors can occur (ex. A paired with a C instead of a T)
 - Errors occur 1 out of 100,000 base-pairs (a relatively high error rate).
 - Unrepaired errors result in permanent _____, which can lead to diseases like cancer.

EXAMPLE: DNA Errors Resemble “Typos.”



DNA Proofreading & Repair Enzymes

- DNA polymerases have a “_____” ability allowing them to fix *many* errors/mistakes.
 - Proofreading _____ the error rate to 1 in 10 billion base-pairs.
- Other DNA _____ Enzymes can help to correct errors that were not fixed by proofreading.



PRACTICE: Researchers found a strain of *E. coli* bacteria that had mutation rates one hundred times higher than normal.

Which of the following statements correctly describes the most likely cause of these mutations?

- The single-stranded binding proteins were malfunctioning during DNA replication.
- There were one or more mutations in the RNA primer.
- The proofreading mechanism of DNA polymerase was malfunctioning.
- The DNA polymerase was unable to add bases to the 3' end of the growing DNA strand.