

Genetic Mutations

What mistakes can occur when DNA is replicated?

Why?

The genes encoded in your DNA result in the production of proteins that perform specific functions within your cells. Various environmental factors and spontaneous events can lead to changes in genes. These changes, called **mutations**, can lead to alterations in the structure and activity of the proteins your cells use in their daily activities. In other words, changes to your genotype can result in changes to your phenotype. We all have mutations in most of our body cells—yet we are, for the most part, normal and functional human beings. How can that be?

Model 1 – Gene Mutations

Sequence 1 (normal)

DNA sequence	... T A C G T A G T C A C C T A A T G G A T C ...
mRNA sequence	A U G C A U C A G U G G A U U A C C U A G
Amino acid sequence	Met His Gln Trp Ile Thr stop

Sequence 2 (substitution)

DNA sequence	... T A C G T A G T C A <u>G</u> C T A A T G G A T C ...
mRNA sequence	A U G C A U C A G U <u>C</u> G A U U A C C U A G
Amino acid sequence	Met His Gln <u>Ser</u> Ile Thr stop

Sequence 3 (insertion)

DNA sequence	... T A C G T A T <u>G</u> T C A C C T A A T G G A T C ...
mRNA sequence	A U G C A U A C A G U G G A U U A C C U A G ...
Amino acid sequence	Met His Thr Val Asp Tyr Leu...

Sequence 4 (deletion)

DNA sequence	... T A C G T A G T C <u>C</u> C T A A T G G A T C ...
mRNA sequence	A U G C A U C A G G G A U U A C C U A G ...
Amino acid sequence	Met His Gln Gly Leu Pro...

1. How many nucleotides are present in the "normal" DNA sequence in Model 1?
21 nucleotides
2. How many codons are contained in the mRNA that is produced by the "normal" DNA in Model 1?
7 codons (triplets)
3. How many amino acids will be in the polypeptide produced by the normal DNA/mRNA sequence?
7 amino acids

Genetic Mutation Pogil Answer Key

Victor M. Corman



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