

# 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 Mutations Pogil Answer Key

**Veronica S. Kilmer Nussbaum, Goshen  
College. Biology Senior Seminar**

## Genetic Mutations Pogil Answer Key:

**Understanding the Impact of Gene mutation on Health & Diseases. An Overview.** Dr.HAKIM ,2020-04-09 Each cell depends on thousands of proteins to do their jobs in the right places at the right times to function correctly Sometimes gene mutations prevent one or more of these proteins from working properly By changing a gene s instructions for making a protein a mutation can cause the protein to malfunction or to be missing entirely When a mutation alters a protein that plays a critical role in the body it can disrupt normal development or cause a medical condition A condition caused by mutations in one or more genes is called a genetic disorder In some cases gene mutations are so severe that they prevent an embryo from surviving until birth These changes occur in genes that are essential for development and often disrupt the development of an embryo in its earliest stages Because these mutations have very serious effects they are incompatible with life It is important to note that genes themselves do not cause disease genetic disorders are caused by mutations that make a gene function improperly For example when people say that someone has the cystic fibrosis gene they are usually referring to a mutated version of the CFTR gene which causes the disease All people including those without cystic fibrosis have a version of the CFTR gene An attempt has been made in this informative Booklet to summarize the fundamental topics related to genetic mutations and its impact on health and development along with several illustrations Dr H K Saboowala M B Bom M R S H London *Genetic Mutations Affect Our Lives* Veronica S. Kilmer Nussbaum,Goshen College. Biology Senior Seminar,1995 Finding Mutations J. Ross Hawkins,1997 **Mutations** Macy Conference on Genetics (2nd 1960,Foundation Josiah Macy, Jr,William J Schull,2021-09-09 This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it This work is in the public domain in the United States of America and possibly other nations Within the United States you may freely copy and distribute this work as no entity individual or corporate has a copyright on the body of the work Scholars believe and we concur that this work is important enough to be preserved reproduced and made generally available to the public To ensure a quality reading experience this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy to read typeface We appreciate your support of the preservation process and thank you for being an important part of keeping this knowledge alive and relevant

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