



super - toddler article

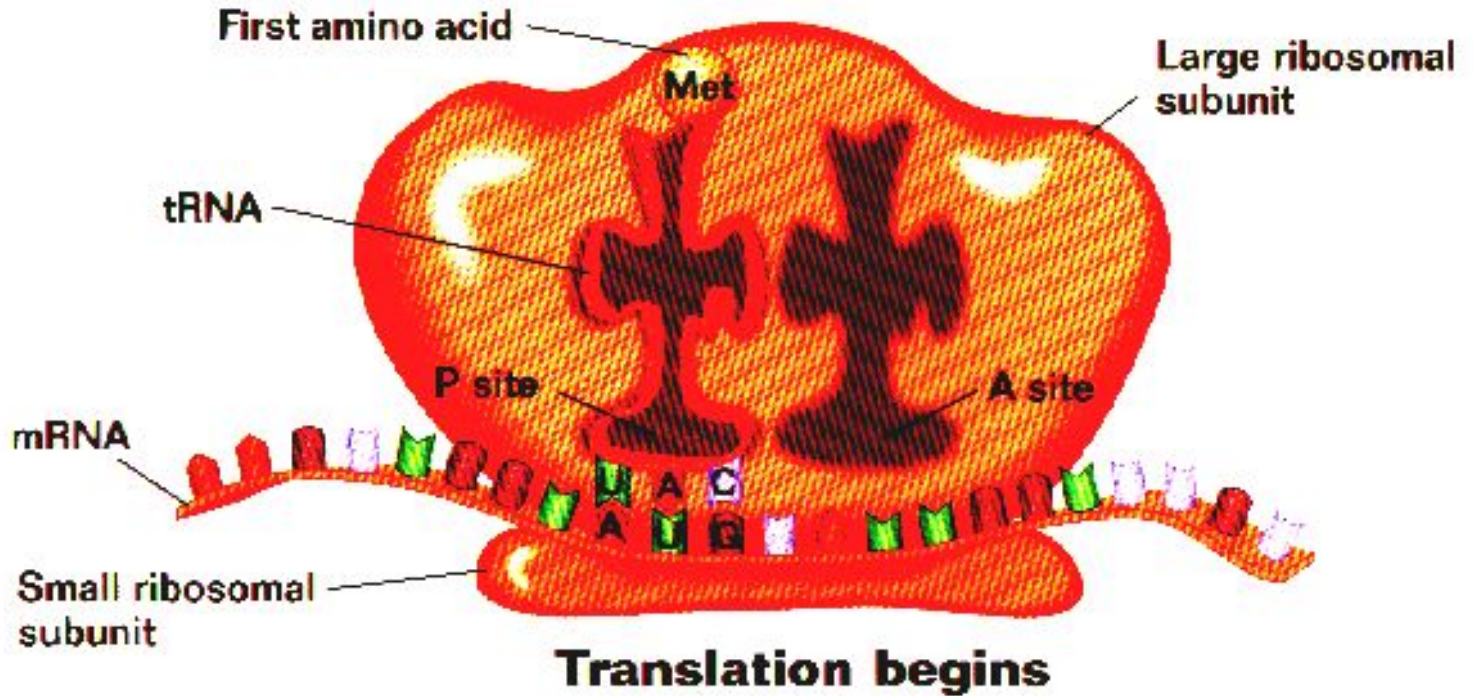
Std4c Objective: Explain how mutations may or may not affect the sequence of amino acids in a protein.

Announcements:  
Read pages 302-307



# Transcription and Translation Quiz

## Study Page DNA11



DNA → RNA → Protein → Trait

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This is known as the  
**Central Dogma of Molecular Biology**

## 11.3 Genetic Changes Notes DNA16



- Genetic changes are called mutations
- Caused by mistakes in DNA replication, or
- Caused by mutagens, such as; radiation, chemicals, and high temperatures.
- Mutagens can affect two different types of cells
  - 1. Somatic cells, called body cells, - lead to personal effects due to mitosis, and can become cancerous.
  - 2. Reproductive cells, called gametic cells, - lead to possible effects of offspring due to meiosis, and can cause birth defects.

- Only 3% of our DNA is actually genes & we have about 25,000 genes.
- DNA repair enzymes can fix structural mistakes in DNA, especially ones occurring from replication errors

A portrait of J. Michael Bishop, M.D., a cancer researcher. He is an older man with white hair, a white beard, and glasses, wearing a dark suit jacket, a light blue shirt, and a dark tie. The background is a warm, wood-paneled wall.

**J. Michael Bishop, M.D.**  
**CANCER RESEARCHER**

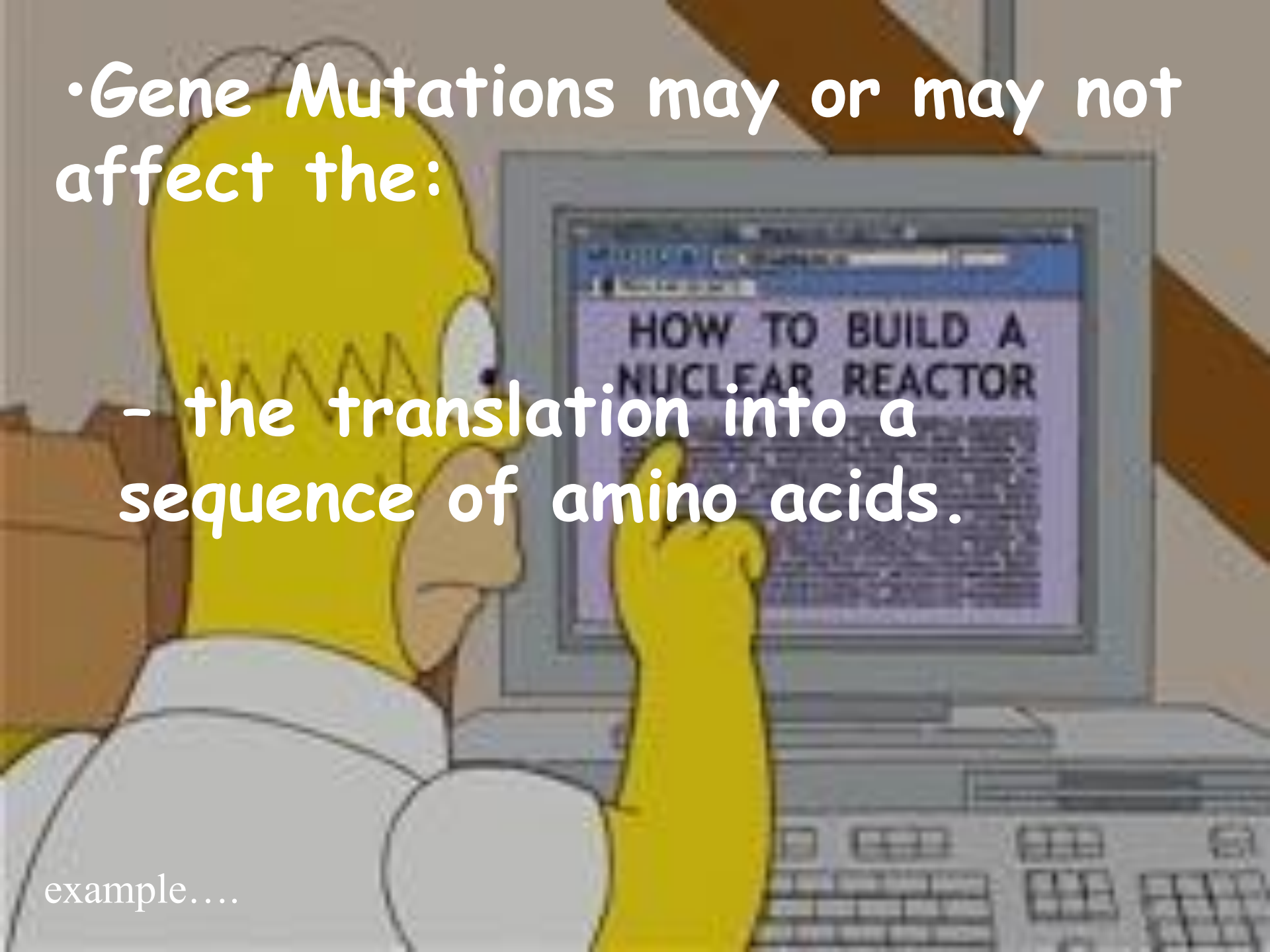
**Discovery**  
**EDUCATION**



• Gene Mutations may or may not affect the:

- the translation into a sequence of amino acids.

example....





# The universal mRNA genetic code table for translation.

<i>FIRST LETTER</i> ↓	<i>Second Letter</i>				<i>3rd Letter</i> ↓
	U	C	A	G	
U	PHE	SER	TYR	CYS	U
	PHE	SER	TYR	CYS	C
	LEU	SER	<b>STOP</b>	<b>STOP</b>	A
	LEU	SER	<b>STOP</b>	TRY	G
C	LEU	PRO	HIS	ARG	U
	LEU	PRO	HIS	ARG	C
	LEU	PRO	GLN	ARG	A
	LEU	PRO	GLN	ARG	G
A	ISO	THR	ASN	SER	U
	ISO	THR	ASN	SER	C
	ISO	THR	LYS	ARG	A
	MET	THR	LYS	ARG	G
G	VAL	ALA	ASP	GLY	U
	VAL	ALA	ASP	GLY	C
	VAL	ALA	GLU	GLY	A
	VAL	ALA	GLU	GLY	G

# Mutations Handout DNA16

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## GENE MUTATIONS VS. CHROMOSOMAL MUTATIONS

\*overheads



03-14-11

A large group of X-Men characters, including Cyclops, Storm, Wolverine, and many others, are gathered in a rocky, fiery landscape. Cyclops is in the foreground, looking towards the viewer. The background is filled with other mutants, some with wings, some with claws, and some with glowing powers. The scene is set against a backdrop of orange and yellow flames and a dark, rocky terrain.

Obj. Describe how mutations may or may not affect the sequence of amino acids in a protein.



# Gene Mutations & Proteins is DNA17

<i>FIRST LETTER</i> ↓	<i>Second Letter</i>				<i>3rd Letter</i> ↓
	U	C	A	G	
U	PHE	SER	TYR	CYS	U
	PHE	SER	TYR	CYS	C
	LEU	SER	<b>STOP</b>	<b>STOP</b>	A
	LEU	SER	<b>STOP</b>	TRP	G
C	LEU	PRO	HIS	ARG	U
	LEU	PRO	HIS	ARG	C
	LEU	PRO	GLN	ARG	A
	LEU	PRO	GLN	ARG	G
A	ISO	THR	ASN	SER	U
	ISO	THR	ASN	SER	C
	ISO	THR	LYS	ARG	A
	MET	THR	LYS	ARG	G
G	VAL	ALA	ASP	GLY	U
	VAL	ALA	ASP	GLY	C
	VAL	ALA	GLU	GLY	A
	VAL	ALA	GLU	GLY	G

- AAT, GCC, AGT, GGT, TCG, CAC
- UUA, CGG, UCA, CCA, AGC, GUG
- Leu, Arg, Ser, Pro, Ser, Val



4. AAT, **CCC**, AGT, GGT, TCG, CAC

4. UUA, **GGG**, UCA, CCA, AGC, GUG

4. Leu, **Gly**, Ser, Pro, Ser, Val

5. AAT, **GGC**, CAG, TGG, TTC, GCA, C

5. UUA, **CCG**, **GUC**, **ACC**, **AAG**, **CGU**, G

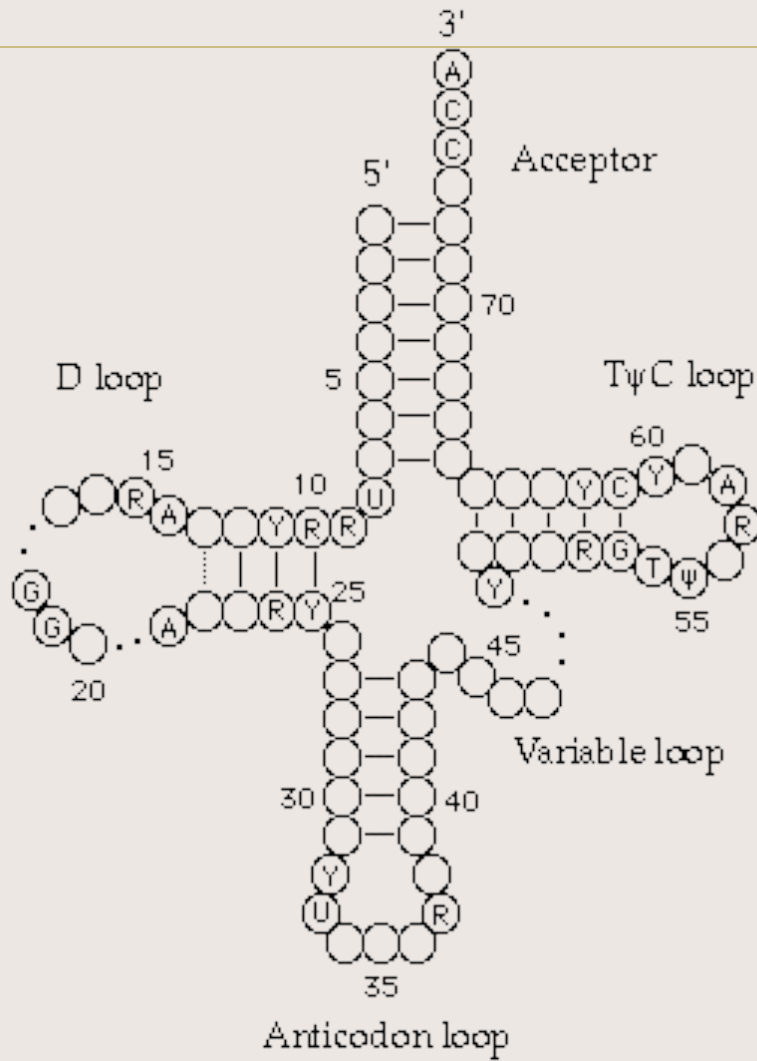
5. Leu, **Pro**, **Val**, **Thr**, **Lys**, **Arg**

# Transcription and Translation Quiz DNA 18

<i>FIRST LETTER</i> ↓	<i>Second Letter</i>				<i>3rd Letter</i> ↓
	U	C	A	G	
U	PHE	SER	TYR	CYS	U
	PHE	SER	TYR	CYS	C
	LEU	SER	<b>STOP</b>	<b>STOP</b>	A
	LEU	SER	<b>STOP</b>	TRY	G
C	LEU	PRO	HIS	ARG	U
	LEU	PRO	HIS	ARG	C
	LEU	PRO	GLN	ARG	A
	LEU	PRO	GLN	ARG	G
A	ISO	THR	ASN	SER	U
	ISO	THR	ASN	SER	C
	ISO	THR	LYS	ARG	A
	MET	THR	LYS	ARG	G
G	VAL	ALA	ASP	GLY	U
	VAL	ALA	ASP	GLY	C
	VAL	ALA	GLU	GLY	A
	VAL	ALA	GLU	GLY	G



# Translation Quiz



**15-17 A**

**14 B**

**12-13 C**

**10-11 D**