super - toddler article

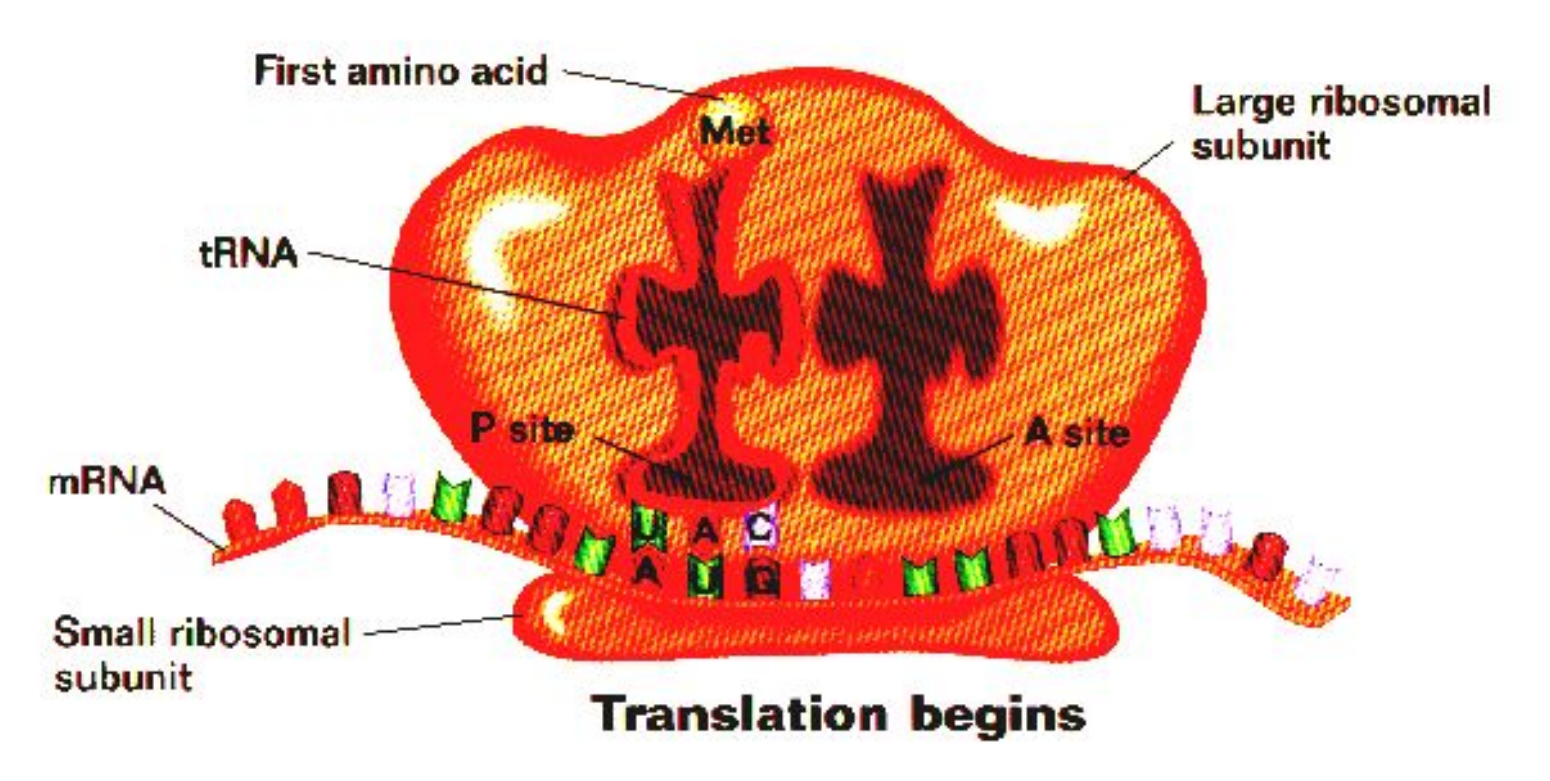
<u>Std4c Objective:</u> Explain how mutations may or may not affect the sequence of amino acids in a protein.

<u>Announcements:</u>

Read pages 302-307

Transcription and Translation Quiz

Study Page DNA11



DNA → RNA → Protein → Trait

This is known as the

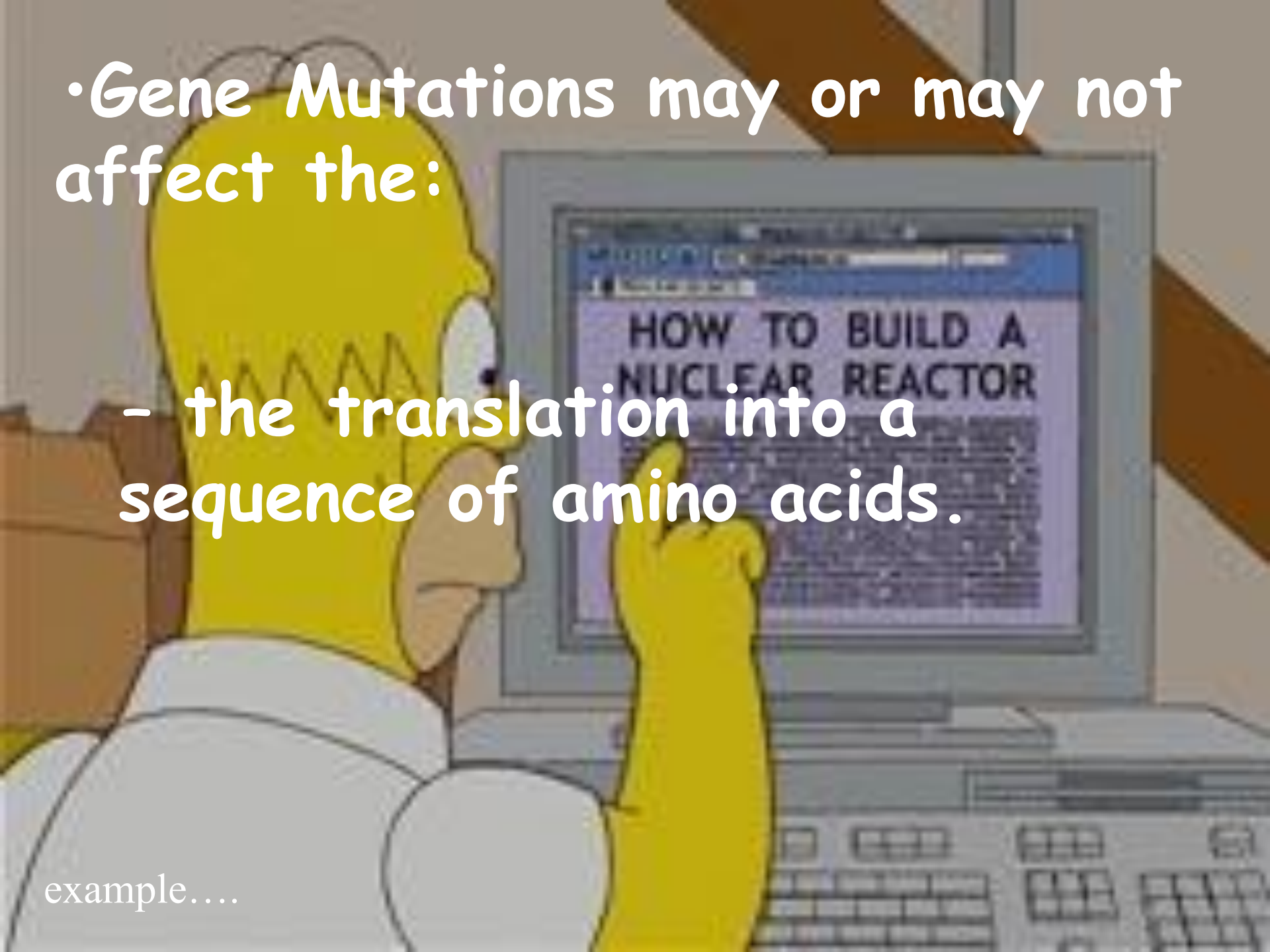
Central Dogma of Molecular Biology

11.3 Genetic Changes Notes DNA16

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


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.

FIRST LETTER ↓	Second Letter: U	C	A	G	*3rd Letter* ↓
U	PHE	SER	TYR	CYS	U
	PHE	SER	TYR	CYS	C
	LEU	SER	**STOP**	**STOP**	A
	LEU	SER	**STOP**	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

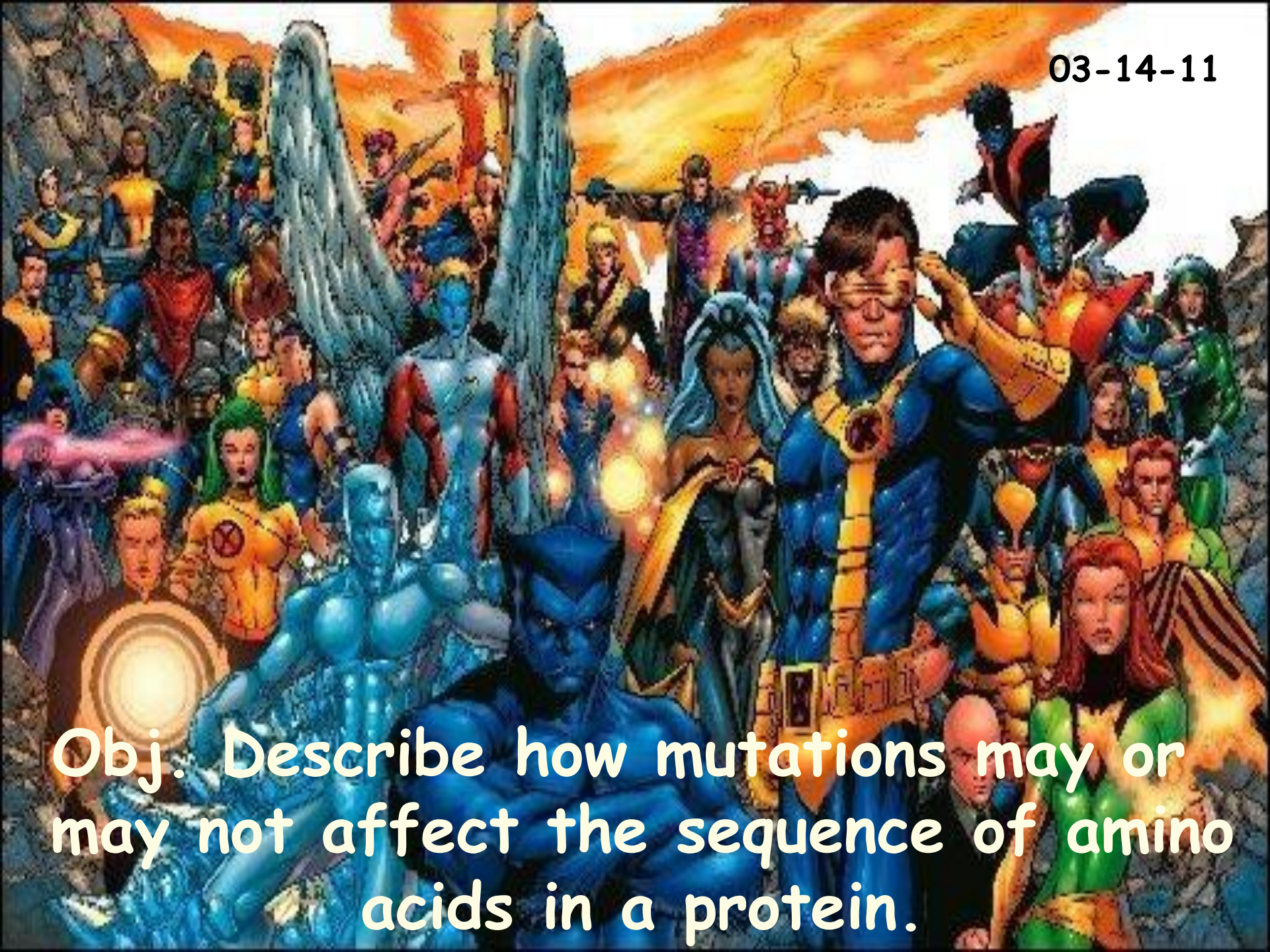
Mutations Handout DNA16

GENE MUTATIONS

vs.

CHROMOSOMAL MUTATIONS

*overheads



03-14-11

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

Gene Mutations & Proteins is DNA17

FIRST LETTER ↓	Second Letter: U	C	A	G	3rd Letter ↓
U	PHE	SER	TYR	CYS	U
	PHE	SER	TYR	CYS	C
	LEU	SER	**STOP**	**STOP**	A
	LEU	SER	**STOP**	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

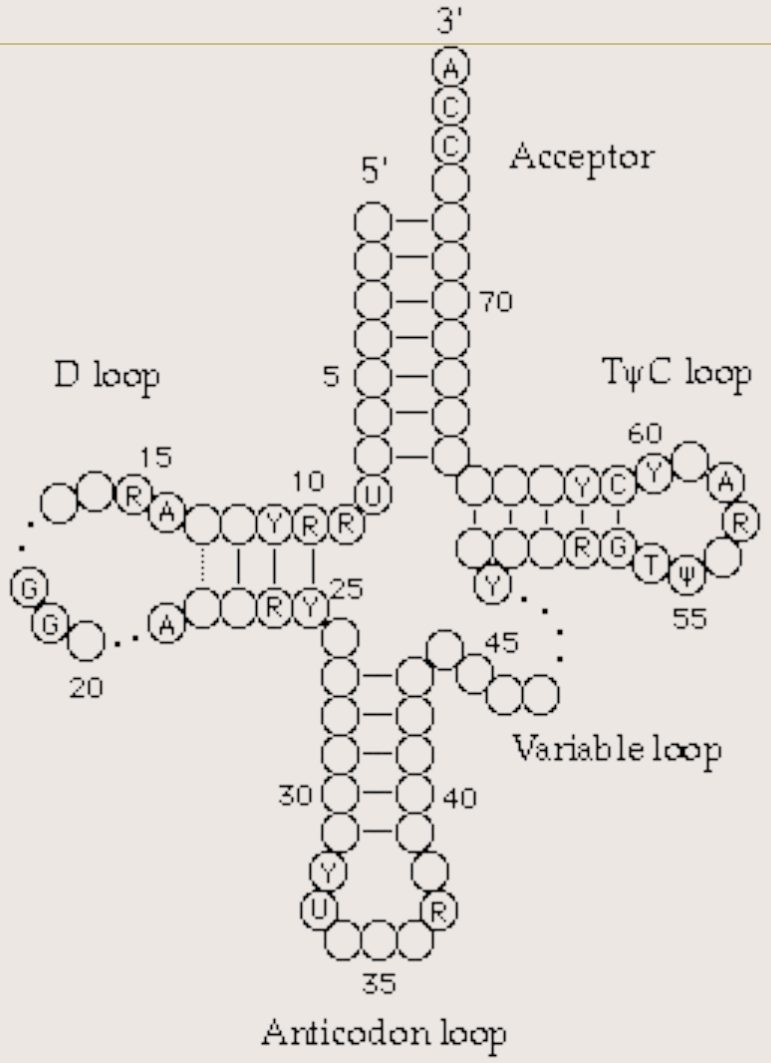
5. UUA, CCG, GUC, ACC, AAG, CGU, G

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

Transcription and Translation Quiz DNA 18

FIRST LETTER ↓	Second Letter: U	C	A	G	3rd Letter ↓
U	PHE	SER	TYR	CYS	U
	PHE	SER	TYR	CYS	C
	LEU	SER	**STOP**	**STOP**	A
	LEU	SER	**STOP**	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