

Name: _____

TRANSCRIPTION & TRANSLATION

The goal of this activity is to transcribe and translate this DNA sequence to a polypeptide (protein). This DNA sequence belongs to a zebrafish. Zebrafish are important to research because they share 70% of the genes with humans.

STEP 1: Transcribe DNA to RNA. (A > U; T > A; C > G; G > C)

STEP 2: Translate RNA to amino acids using the codon box below. Use the letter for each amino acid.

STEP 3: Use the table to decide which protein you made.

	U	C	A	G	
U	UUU } Phe - F UUC } UUA } Leu - L UUG }	UCU } UCC } Ser - S UCA } UCG }	UAU } Tyr - Y UAC } UAA Stop UAG Stop	UGU } Cys - C UGC } UGA Stop UGG } Trp - W	U C A G
C	CUU } CUC } Leu - L CUA } CUG }	CCU } CCC } Pro - P CCA } CCG }	CAU } His - H CAC } CAA } Gln - Q CAG }	CGU } CGC } Arg - R CGA } CGG }	U C A G
A	AUU } AUC } Ile - I AUA } AUG Met - M	ACU } ACC } Thr - T ACA } ACG }	AAU } Asn - N AAC } AAA } Lys - K AAG }	AGU } Ser - S AGC } AGA } Arg - R AGG }	U C A G
G	GUU } GUC } Val - V GUA } GUG }	GCU } GCC } Ala - A GCA } GCG }	GAU } Asp - D GAC } GAA } Glu - E GAG }	GGU } GGC } Gly - G GGA } GGG }	U C A G

D N A	TAC CAA CTC ACC TGT CTA CGG CTC GCG TGT CGG TAG GAA CCG GAC ACC CCT TTC GAG TTA
R N A	AUG GUU GAG UGG ACA GAU GCC GAG CGC ACA GCC AUC CUU GGC CUG UGG GGA AAG CUC AAU
A A	M-V-E-W-T-D-A-E-R-T-A-I-L-G-L-W-G-K-L-N

Using the amino acid sequence provided above, refer to the table below to identify the corresponding protein. Once you have found the matching protein, draw a circle around it.

Protein Name	Amino Acid Sequence
Estrogen Receptor Alpha	MVMSAHDRNT AGPTRSP
→ Beta-globin	MVEWTDAERT AILGLWGKLN
T-Cell Receptor Alpha	XTNNVGRMIF GKGTKLIVDS
Connective Tissue Growth Factor	MFGMTQSTVI ALLFLTFLRW

CONCLUSION:

The protein I translated is: ___Beta Globin

I researched this protein and discovered that its function is: It is one of four chains that make up a hemoglobin molecule. Hemoglobin carries oxygen in red blood cells.

If there were a mutation in the original DNA sequence, how would that affect the protein?___If there were a DNA mutation in this code it would cause a mistake in the RNA transcript. This would result in the wrong amino acid sequence and therefore a faulty protein._

Where in the cell does transcription occur?___Transcription happens in the nucleus where the DNA is._

Where in the cell does translation occur?___Translation occurs in the cytoplasm on a ribosome.