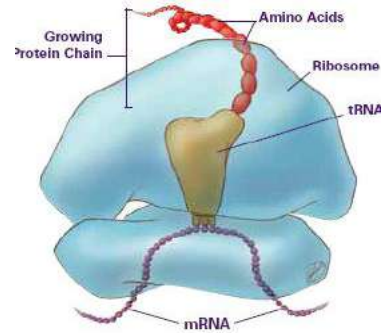


Lesson 6: Monday, March 30, 2020. Biology MHS

AIM: How does an amino acid chain turn into a functional protein with a specific role?

This picture is a little abstract, but you can see “the big thing” is the **ribosome**, and the **mRNA is moving through it**. You can see that **3 mRNA bases are “locked into”** the ribosome. You can also see that a “**growing protein chain**” of “**amino acids**” is coming out of the ribosome. As the ribosome reads the mRNA, *it creates a chain of amino acids*, which will turn into the final **protein**



At this point, you should be able to go from **DNA**, to **mRNA**, to **amino acid**. Don't forget, the *sequence of DNA* that codes for the protein is called a **GENE**. The DNA in the gene must *first be turned into a strand of mRNA*. Then, the **mRNA** goes to the **ribosome**, where it is read **three bases at a time**. Every three bases codes for ONE amino acid. To determine which amino acid the ribosome will code for, you must use the **universal genetic code chart**. A protein is built from a sequence of amino acids.

Universal Genetic Code Chart
Messenger RNA Codons and the Amino Acids for Which They Code

		SECOND BASE				
		U	C	A	G	
FIRST BASE	U	UUU } PHE UUC } UUA } LEU UUG }	UCU } UCC } SER UCA } UCG }	UAU } TYR UAC } UAA } STOP UAG }	UGU } CYS UGC } UGA } STOP UGG } TRP	U C A G
	C	CUU } CUC } LEU CUA } CUG }	CCU } CCC } PRO CCA } CCG }	CAU } HIS CAC } CAA } GLN CAG }	CGU } CGC } ARG CGA } CGG }	U C A G
	A	AUU } AUC } ILE AUA } AUG } MET or START	ACU } ACC } THR ACA } ACG }	AAU } ASN AAC } AAA } LYS AAG }	AGU } SER AGC } AGA } ARG AGG }	U C A G
	G	GUU } GUC } VAL GUA } GUG }	GCU } GCC } ALA GCA } GCG }	GAU } ASP GAC } GAA } GLU GAG }	GGU } GGC } GLY GGA } GGG }	U C A G

EXAMPLE:

DNA: TAC CCA TGC CGA CCT
mRNA: AUG GGU ACG GCU GGA
Amino acid: met gly thr ala gly

NOW YOU PRACTICE. If given a sequence of DNA, you should be able to complete the rest.

DNA	TTA	CAA	GAT	AAA	GGA	GTA	ACC	ACT
mRNA								
Amino acid								

What's up with the “**START**” and “**STOP**” amino acids?....

- In real life, all proteins start with Met (*methionine*), which is the “**start**” amino acid.
- If the ribosome reads an mRNA sequence that codes for a **STOP**, it is a signal to release the chain of amino acids.
- Once the chain of amino acids is released, it will bend, fold, and twist into a functional protein with a specific SHAPE!!!
- ONCE AGAIN- it leaves the ribosome as a *specific chain of amino acids*.
- The sequence of amino acids will determine *how* the proteins bends, folds, and twists.
- This determines the final **SHAPE** of the protein, which will determine its **JOB**.

