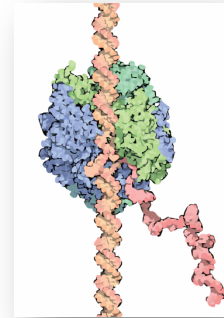




Protein Synthesis Analogy Drawing

Activity

Protein synthesis involves connecting amino acids into chains beginning at a control center (the nucleus of the cell) to get a copy of the original plan (DNA) and transcribe that plan into a code that will result in a specific amino acid sequence in a polypeptide chain. To make an analogy (comparison) drawing, think of real life situations where instructions are given to workers who will assemble coded sequences of a product.



Procedure:

1. In your lab journal, create your **Key**. Be sure to explain each part of your analogy and how it represents the actual process of Protein Synthesis. An example key:
DNA = Original Pyramid Blue-print
mRNA = The Scribe's Copy of the Pyramid Blue-prints
Ribosome = The Builders/Workers
rRNA = Assistant Architects that Break the Building of the Pyramid into smaller tasks
tRNA = Quarry Workers that bring the stones to the Builders/Workers
Amino Acids = Limestone Blocks of the Pyramid
Peptide Bond = Stuff between the Limestone Blocks that Keeps the Pyramid Together
Protein = The Finished Pyramid and all its parts
2. In your lab journal (excluding the space for your Key), draw, as well as describe, a depiction of each step of protein synthesis. See the example on the next page.
3. Additional steps to be included:
 1. DNA cannot leave the nucleus, so it unzips to allow mRNA to make a copy.
 2. Before leaving the nucleus, mRNA reviews the copied sequence of DNA and removes introns, only leaving exons. This represents splicing.
 3. mRNA leaves the nucleus and heads to the ribosome.
 4. Ribosome (rRNA) translates the mRNA into sections of three bases called a codon.
 5. Once all the codons are translated correctly, a chemical signal is sent out to the tRNAs. tRNA then brings the correct amino acids (anticodon) one at a time to the ribosome.
 6. The ribosome binds the amino acids together by peptide bonds.
 7. Lastly, the finished protein (chain of amino acids) gets sent where it is needed, OR goes to the Golgi Body for modification/folding, etc.



Do

Protein Synthesis Analogy Drawing

Activity, continued

Drawing Example:

DNA - Original Pyramid
Blue Print

mRNA - The Scribe's copy

Ribosome - The builders/workers

rRNA - Assistant architect

tRNA - Quarry Workers

Amino Acids - Limestone blocks

Protein - The Pyramid

1. The architect of the pharaoh isn't allowed to leave the palace, so he needs to trust worthy men to copy and transport his drawings to the quarry workers. He has his sons do it for him.

2. The scribes copy their father's plans on papyrus rolls, preparing them for the quarry workers.

3. Before the scribes leave with the copied plans, the assistant architect reviews them and keeps only the accurate, neat drawings; and discards everything else. He separates the plans into piles, with 3 drawings in a pile for all of the overseers at the construction site.

4. Now that the plans have been drafted, the scribes take their drawings to the workers at the construction site.

5. When the overseers show the drawings to the workers, they can't read the descriptions, for it is written in traditional hieroglyphs. The workers can only read hieroglyphs, so the overseer translates it for them.

6. The plans in hieroglyphs can now be read by the quarry workers. They take the limestone blocks they have prepared and drag them back to the construction site, along with the blocks.

7. The limestone blocks are put together using the "blueprint" to build the pyramid. The workers spend 20 years finishing it.