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Anatomy & Physiology 12
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Ms. Yorke

RNA Transcription & Translation

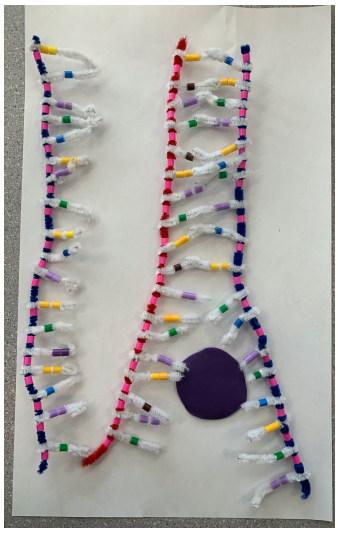
RNA Transcription Model

1. mRNA is different than DNA in many ways. DNA has the base of thymine whereas mRNA had an uracil base; the rest of the bases were the same. mRNA's sugar is called ribose, but DNA's sugar is called deoxyribose. mRNA is able to travel through the pores of the nucleus due to the small size, but DNA is a macromolecule. mRNA is single stranded; however, DNA has a double helix structure which is double stranded. mRNA is able to travel through the pores of the nucleus due to the small size, but DNA is a macromolecule.

2. The 3 Steps Involved in RNA Transcription:

    a. Unwinding & Unzipping
        - DNA starts by unwinding its double helix then the H-bonds break which allows the RNA Polymerase to produce the mRNA strand through complimentary base pairing.

b. Complimentary Base Pairing
   - The pairing starts by the bases of mRNA pairing with the sense strand which has the information to produce the correct proteins. Therefore, RNA Polymerase has to pair the correct RNA bases to the DNA bases on that sense strand. RNA Polymerase is responsible for H-bonds as well as the joining of adjacent nucleotides which form the sugar phosphate backbone on RNA. Through the model, it is shown that where adenine is, there is an uracil paired to it. this is because mRNA does not have thymine; instead, it has uracil.



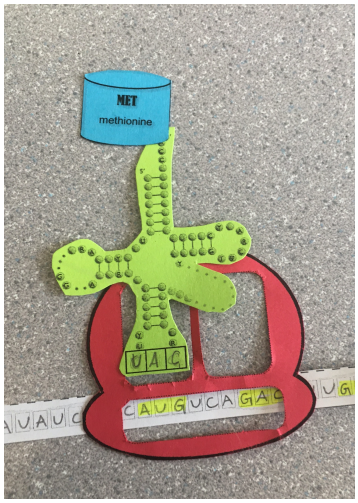
c. Separation
   - Separation is when mRNA separates from DNA in order to let mRNA leave the nucleus and start the translation process. During this step, DNA will zip and wind back together. It then finishes with the original DNA as well as a new mRNA strand.

3. Today's activity did a good job of showing the basic steps of transcription; unwinding and unzipping, complimentary base pairing, and separation. This activity was well suited to showing the process in ways that it had given me the opportunity to see how the processes of RNA transcription worked on a bigger scaled. It helped me understand how the different parts of the RNA worked since I was able to visualize it physically. However, due to the fact that we were using pipe cleaners and beads, it was definitely harder to show the smaller details of the process and that is where a lot of the confusion happened in the beginning; but it became easier to form since we didn't have to worry about the smaller details and focus on the more important and bigger picture.

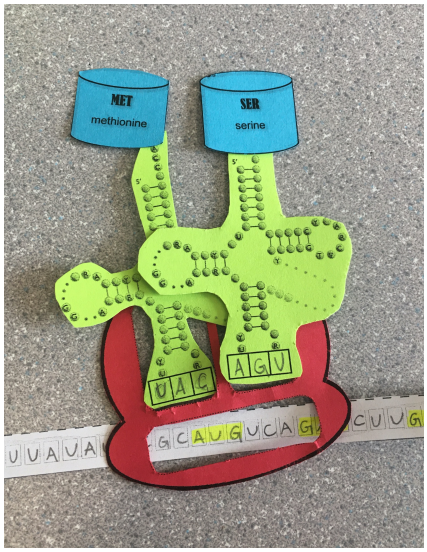
RNA Translation Model

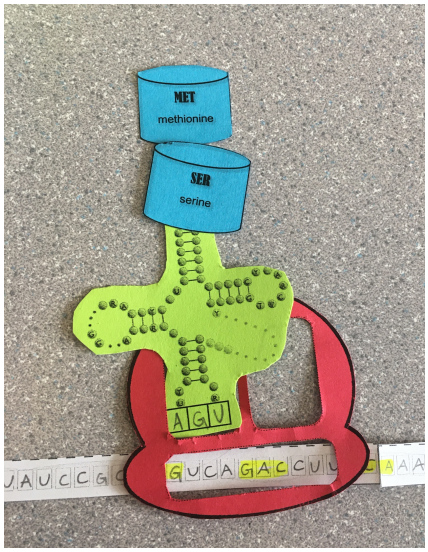
1. The 3 Steps Involved in RNA Translation:

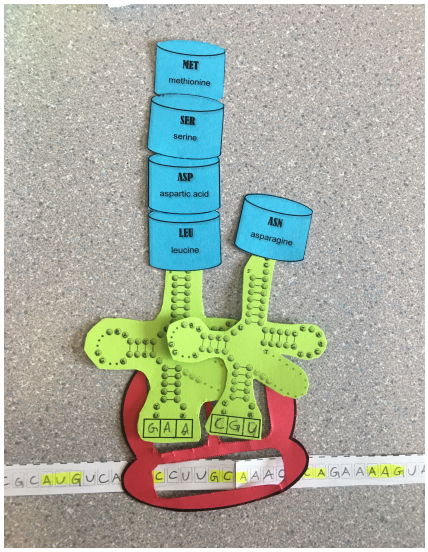
    a. Initiation
    - This is the step where translation starts; it is in the ribosome and is being moved down to the right until the codon "AUG" is in the P-site. Then, tRNA with an anticodon brings the first amino acid which is always methionine in the P-site.

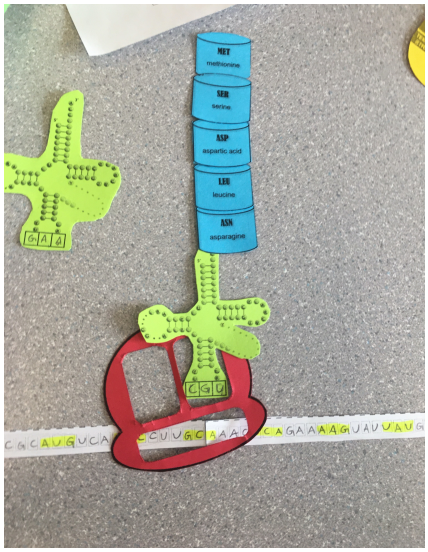


    b. Elongation
    - After initiation, the A-site is filled by an amino acid that tRNA brought. Now, both sites are filled, and the acids keep moving so that they are able to accept the next amino acid that the codon on mRNA calls for.

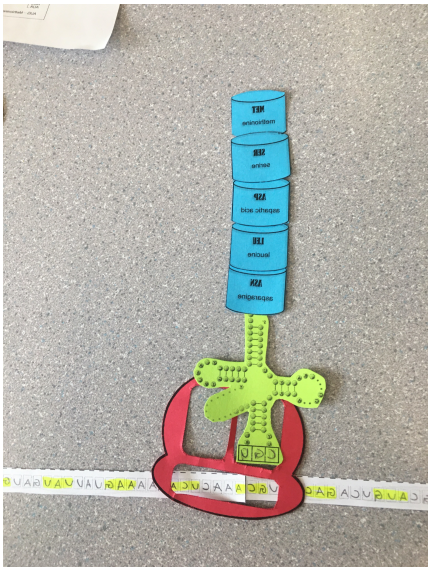








c. Termination
   - This is the last step which allows the polypeptide chain to become a functioning protein. In order for this to happen, 1 of 3 stop codons need to be read on the mRNA. After the stop codon is read, there is not going to be anymore complimentary tRNA; then the ribosome releases the mRNA, tRNA, and the polypeptide chain.



2. Today's activity did a good job of showing the basic steps of translation; initiation, elongation, and termination. This activity was well suited to showing the process in ways that it had given me the opportunity to see how the processes of RNA translation worked on a bigger scaled. However, it was definitely harder to show the smaller details of the process and the letters and codons got confusing as it was harder to determine in the beginning.