Protein Synthesis Demo

Purpose: To help students understand the role of DNA, mRNA, tRNA, and Amino Acids in the role of protein synthesis.

Prelab questions:

1. Where is DNA found?
2. What carries DNA’s message to the ribosome?
3. What carries amino acids to the ribosome?
4. If DNA uses A, T, G, C, what 4 bases does RNA use?
5. If the DNA strand reads ATGCAT, what will the mRNA strand read? What will the tRNA read? How many tRNAs will there be?

Materials: paper, code cards, writing instrument, amino acid word cards w/ corresponding tRNA segments

Procedure:

1. With a partner, go to the nucleus of the classroom and copy the DNA message into mRNA form into your lab book (do just one at a time, there are 20 total).—Remember-DNA doesn’t leave the nucleus, so DO NOT take the cards with you!
2. Using the mRNA message, find the **appropriate order of tRNA** codons and amino acids around the room (these are the codes on the cards that are taped up).
3. Write the correct protein message on your sheet. It should make sense. If it doesn’t, than you’ve made a mistake in the code someplace to cause a mutation. Record this and try to fix it.

Data:

Your data will be the codes and the correct message in the following order

DNA Code:

mRNA Code:

tRNA Code:

Message:

Conclusion:

1. If this were an actual cell doing protein synthesis, what role would you have in this process?
2. Were the codes on the cards codons or anti-codons? How do you know?
3. Which part of the process represents transcription? Which part represents translation?
4. Where in the cell do transcription and translation take place?