Mini Action Research Poster Template

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Nowherelandbergtown High School
Home of the Nuclear Fallouts

Unfolding the mysteries of protein structure

Tomorrow's Science Today SEPA Grant

Abstract:

In a high school biology class, students engage in exploring the intricacies of protein structure, specifically how proteins contribute to melanin production. Through hands-on activities including visual organizers and peer feedback sessions, students navigate the four levels of protein folding, enhancing their understanding of molecular biology fundamentals and preparing them for deeper exploration into enzymatic processes. NGSS standards HS-LS1-1

This lesson is for a high school general biology class. Students are sophomores and they are learning about protein structure for the first time. The context is to understand how a protein can be responsible for making melanin. Students are familiar with transcription and translation but do not know what a protein really is. Later they will learn about enzymes.

Assessment:

Students will be challenged to use Expo Neon markers to make a visual/graphic organizer of all 4 levels of protein folding in a timed setting. Students then completed a Round Robin format and left “mail” for their neighbors of positive and negative feedback. Students then were given the ability to augment their models with things they saw from their neighbors and the “mail” that they received. At the end, students were asked what was one thing they elected to add to their model after the Round Robin and to shout out who gave them that idea to add.

Model/materials: Amino Acid Starter Kit and Molymods

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Throughout this lesson, students will engage in a learning cycle of wonder, explain, and explore. This approach will be used as they first work with the amino acid molymods (one per student), build a polypeptide chain through collaboration. Next, they will observe the AASK amino acids (Without clips) to notice patterns and try to group them. Next, they will sort with the clips and see how they ARE grouped and discuss why. Finally, students will be oriented on the tuber so they can build and then fold the proteins. Please see google slides for the specific steps of this lesson.

Assessment Results

The students learned best by exploring the topics related to protein structure/function repeatedly. Through successive iterations of wondering and exploring, they were able to generate clear explanations of how and why protein structure was important to the production of melanin.

Reflection:

Students were actively engaged throughout this lesson. They were confident in their explanations and worked together to make the best models that they could. During the Round Robin, they provided productive feedback to their peers through the “mail”. At the end of the session, they amended their model with what they learned. It was a fantastic way to end the lesson and solidified their understanding of protein folding.

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