

Macromolecule Milk Reaction Lab; SB1 c,d

Purpose: To understand the various chemical properties of water and the major macromolecules of life.

Materials: Milk (whole or 2%), pie pan, food coloring (red, yellow, green, blue), dish-washing soap & cotton swabs

Experiment Part 1: Water

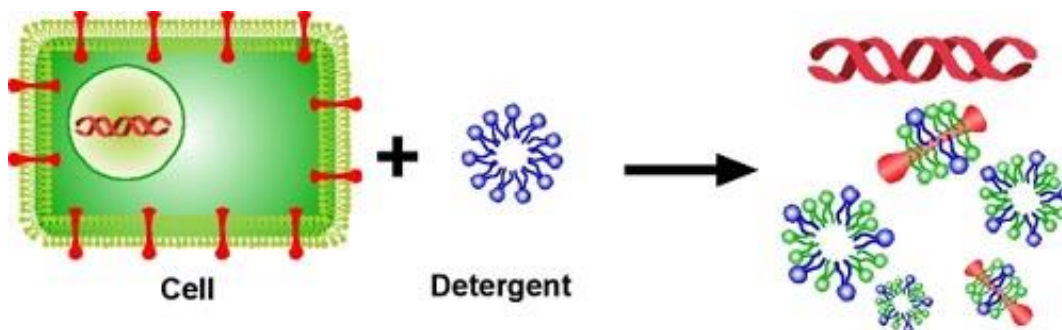
1. Pour enough water in the pie pan to completely cover the bottom with a thin layer and allow it to settle.
2. Add one drop of each of the four colors of food coloring - red, yellow, blue, and green - to the water. Keep the drops close together or on top of one another in the center of the plate of water.
3. Find a clean cotton swab for the next part of the experiment. Hypothesize what will happen when you touch the tip of the cotton swab to the center of the water and record this for question #1. It's important not to stir or the mix... just touch it with the tip of the cotton swab.
4. Place a drop of liquid dish soap on the other tip of the same cotton swab. Place the soapy end of the cotton swab back in the middle of the water and hold it there for 10 to 15 seconds. Experiment with placing the cotton swab at different places in the water.

Experiment Part 2: Milk (make hypothesis first for #3)

Repeat steps 1-5 above EXCEPT THIS TIME USE MILK

Questions (to answer on your own paper and don't forget title, purpose and hypotheses):

- 1) Make a hypothesis for part 1 of the reaction (water). What do you think will happen?
- 2) Describe what happened to the food color as you touched the soap-dipped swab to the water.
- 3) Make a hypothesis for part two of the reaction (milk). What do you think will happen?
- 4) Describe what happened to the food color as you touched the soap-dipped swab to the milk.
- 5) Which macromolecules, and how much of each (in grams), were found in the milk you used today?
- 6) If 1 ml of milk weighs approximately 1g, then what is the milk fat percentage for whole milk? Show your work!



- 7) Thoroughly describe your interpretation of the above diagram. What conclusion did you and your partners come to from these experiments?
- 8) What variables were controlled or constant in this lab? What were the dependant and independent variables?
- 9) Which monomers were in the milk you used today? Refer back to #5 and the label of the milk.
- 10) Write a short essay detailing the chemical interactions that took place between the detergent and the various molecules found in whole milk. At minimum, include the following terms in your answer: lipid, fatty acid, polar molecule, nonpolar molecule, hydrogen bonds, cohesion, surface tension. Take into consideration that in addition to all the aforementioned molecules, milk is over 85% water.
- 11) Redesign this experiment to test for another variable and describe the steps. (think before you answer).
- 12) On you newly designed experiment state a hypothesis for the results. (this is your third hypothesis of the lab)
- 13) Do you believe that milk contains nucleic acids? You must justify your answer.