

Name _____ Date _____ Period _____

DNA ISOLATION FROM STRAWBERRIES

PURPOSE:

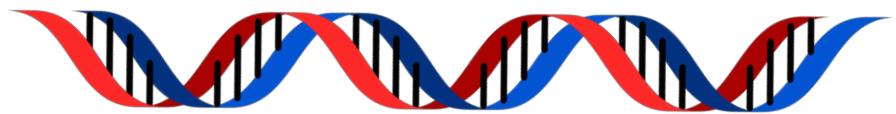
In this activity, you will remove the DNA from cells of a plant. DNA is the chemical code that determines the activity within a cell, and ultimately determines the biology of the entire organism. It is found in virtually all living cells, including the cells in your food and your body. Strawberries were chosen for this investigation because their cells are **octoploid** ($8n=56$)! In other words, strawberries evolved to have 8 copies of each chromosome. Most animals, by contrast, are diploid and only have 2 copies of each chromosome.

MATERIALS:

- 1-3 strawberries (about the volume of a golf ball)
- 10 mL DNA extraction buffer *
- 20 mL ice-cold 95% ethanol (or 91% isopropanol)
- 1 Ziploc bag
- 1 test tube in a test tube rack
- 2 plastic pipettes
- 1 funnel lined with a moistened paper towel
- 1 wooden stick
- microscope slide and coverslip
- 2 toothpicks
- 1-2 drops of water (if needed)
- microscope



* Mix 100 mL shampoo (without conditioner) with 15 grams salt (NaCl). Add enough water to produce a final volume of 1 liter.



PROCEDURE:

1. Remove the green sepals from the strawberries. Place them into a Ziploc bag. Squeeze out as much air as possible and seal shut.
2. Using your fingers, squish for a few minutes to completely mash the fruit. Do not break the bag.
3. Add 10 mL DNA extraction buffer and squish for a few more minutes. **Try not to make a lot of soap bubbles.**
4. Filter through a moistened paper towel set in a funnel and collect the liquid in a test tube. Do not squeeze the paper towel. Collect about 3 mL of liquid.

5. Add 2 volumes of ice-cold ethanol to the strawberry liquid in the test tube. Pour the alcohol **carefully** down the side of the test tube so that it forms a separate layer on top of the strawberry liquid.
6. Wait for about a minute. You should see a white fluffy cloud at the interface between the two liquids. That is the DNA! **Take a photo of your test tube.**
7. Spin and stir the wooden stick in the tangle of DNA, wrapping the DNA around the stick.
8. Pull out the wooden stick and transfer a small portion of the DNA onto a microscope slide. Tease apart the strands using toothpicks. If necessary, add 1-2 drops of water. Place a coverslip on top of the DNA. Firmly press down on the coverslip to remove any air bubbles. Using a paper towel, wipe any excess water from the slide.
9. View your DNA up close using a microscope. **Take a photo of your DNA at low and high power.**

RESULTS:

1. Photo of DNA in the Test Tube
2. Photo of DNA at Low Power
3. Photo of DNA at High Power

POST-LAB QUESTIONS:

1. What was the purpose of using the shampoo? HINT: Since shampoo is a type of soap, it contains amphipathic molecules.
2. What was the purpose of using the salt? HINT: Sodium chloride is an ionic substance. DNA contains many negatively-charged phosphate groups.
3. Why was it necessary to mash the fruit?
4. What was the purpose of using the ethanol? HINT: What happened immediately after adding the ethanol to the test tube?
5. Why did the ethanol float on top of the water?