

Name \_\_\_\_\_

Date \_\_\_\_\_

### DNA Extraction Lab: Strawberry

**Background:** The long, thick fibers of DNA store the information for the functioning of the chemistry of life. DNA is present in every cell of plants and animals. Every cell in a strawberry contains eight copies of each of its chromosomes. As a result, strawberries contain large amounts of DNA. Strawberry DNA is easy to extract because strawberries are easy to mash, and ripe strawberries produce enzymes that contribute to the breakdown of cell walls. To extract the DNA, you will first break strawberry cells apart mechanically by crushing them. Next, you will add detergents to dissolve the cell's plasma membranes. A filtering step then removes cell organelles, broken cell walls, membrane fragments, and other cell debris. The result will be a red-colored solution containing DNA and other small dissolved molecules such as sugars and proteins. When cold isopropyl alcohol is layered on top of this solution, molecules of alcohol repel the DNA molecules and the DNA molecules clump together. A ropelike clump of many DNA molecules forms that is large enough to see with the unaided eye.

#### Pre-lab questions:

1. What do you think the DNA will look like?
2. Where is DNA found?
3. It is important that you understand the steps in the extraction procedure and why each step was necessary. Each step in the procedure aided in isolating the DNA from other cellular materials. Match the procedure with its function:

#### PROCEDURE

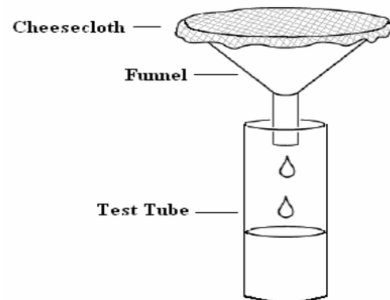
- A. Filter strawberry slurry through cheesecloth
- B. Mash strawberry with salty/soapy solution
- C. Initial smashing and grinding of strawberry
- D. Addition of ethanol to filtered extract

#### FUNCTION

- \_\_\_ To precipitate DNA from solution
- \_\_\_ Separate components of the cell
- \_\_\_ Break open the cells
- \_\_\_ Break up proteins and dissolve cell membranes

#### Materials:

Heavy duty Ziploc bag  
1 strawberry  
10 mL DNA extraction buffer (soapy, salty water)  
Cheesecloth  
Funnel  
50mL vial / test tube  
1 coffee stirrer  
20 mL ice cold isopropyl alcohol  
Watch glass  
Test tube rack



#### Procedure:

1. Remove the green sepals from the strawberry. Place one strawberry in a Ziploc bag and seal the bag shut.
2. Smash/grind up the strawberry using your fist and fingers for 2 minutes. *Careful not to break the bag!!*
3. Add the provided 10mL of extraction buffer (salt and soap solution) to the bag.
4. Knead/mush the strawberry in the bag again for 1 minute – *try not to make a lot of soap bubbles!*
5. Assemble your filtration apparatus as shown above/right.