

Name \_\_\_\_\_

## DNA Spooling from Strawberries

### **Introduction:**

All eukaryotic cells contain DNA in their nucleus. The DNA stores genetic information that gives the cell instructions. What does the DNA look like? How can we get it out of cells?

*There three basic steps in the extraction of DNA from cells:*

1. The cell must be lysed (broken open) to release the nucleus. The nucleus must also be opened to release the DNA.
2. Next, the DNA must be protected from enzymes that will degrade it.
3. Once the DNA is released, it must then be precipitated

*Both chemical and physical means are used to extract the DNA from the cells:*

1. In order for the cell to be lysed, the phospholipid cell membrane must be broken down.
  - The detergent and salt solution accomplishes this.
  - Cell membranes (and cell walls in plants) and nuclear membranes are also broken down by the action of blending, grinding, smashing, and mashing.
2. The DNA must be protected from enzymes.
  - Keeping solutions cool will slow enzyme action.
  - The extraction buffer uses salt which also deactivates the enzymes that degrade DNA when it is released from the nucleus.
3. The DNA must precipitate.
  - Isopropanol is used to precipitate the DNA. In water, DNA is soluble (dissolves).
  - When DNA is in isopropanol, it uncoils and precipitates.

**Purpose:** To observe the physical and chemical properties of DNA.

### **Materials:**

- funnel
  - cheesecloth
  - strawberry
  - Ziploc sandwich bag
  - 10 mL graduated cylinder
- extraction buffer
  - test tube (medium (25mL))
  - isopropanol (rubbing alcohol)
  - bamboo skewer
  - scissors

<p>Recipe for 100 mL Extraction Buffer (you need - 10mL per group)</p>
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| <ul style="list-style-type: none"> <li>• 2 g salt</li> <li>• 90 mL water</li> <li>• 10 mL detergent (Dawn original)</li> </ul> |
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### **Procedure:**

1. Prepare a funnel with a double layer of cheesecloth and a test tube.
2. Place one strawberry in a Ziploc baggie and zip it closed. Try to get out as much air as you can.
3. Smash up the strawberry with your hand and fingers for 2 minutes.
4. Using a graduated cylinder, add 10 mL of the extraction buffer to the bag and zip it closed. Try to get as much air out as you can.
5. Mash again with your fingers for 1 minute. Try not to get the mixture foamy.
6. Cut off one of the lower corners of the Ziploc bag.
7. Squeeze the extract (strawberry mush) from the cut corner of the bag

