



Group members: \_\_\_\_\_

Date: \_\_\_\_\_

## Banana DNA Extraction

In this exercise you will be extracting DNA from a banana.

Your group will need:

### Tools

- Safety goggles – 1/person
- 1 sandwich-sized resealable bag
- 1 pair of scissors
- 3 - 500 mL (16 ounce) plastic cups
- 1 - 5 mL (1 tsp) measuring spoon
- 1 - 1.25 mL (1/4 tsp) measuring spoon
- 1 - 15 mL (1 tbsp.) measuring spoon
- 1 plastic spoon
- 1 coffee filter (cone type)
- 1 wooden stir stick

### Materials

- 1 - 4 cm long piece of **ripe** banana
- 5 mL (1 tsp) liquid dish detergent (e.g., Sunlight®)
- 1.25 mL (1/4 tsp) table salt
- 62.5 mL (1/4 cup) plus 30 mL (2 tbsp.) distilled or tap water
- 62.5 mL (1/4 cup) Isopropyl (rubbing) alcohol

### Procedure

1. Each group member should put on a pair of safety goggles.
2. Put the banana into the resealable bag. Close securely. Mash the banana well with your hands.
3. Carefully snip one corner of the bag. Squeeze the mashed banana into one of the plastic cups. Add an equal amount of water into the cup and stir well.
4. Measure 5 mL of liquid dish detergent. Put into the second plastic cup.
5. Measure 1.25 mL table salt. Put into the same cup as the dish detergent.
6. Measure 30 mL (2 tbsp.) distilled or taps water. Put into the cup with the dish detergent and salt.
7. Stir gently to avoid making bubbles. Stir until the soap is mixed well and the salt has dissolved.
8. Add 30 mL (2 tbsp.) of the banana mixture into the cup with the soap/salt solution. Stir the mixture gently with a spoon for at least **10 minutes**.
9. Insert the coffee filter into the third plastic cup. Make sure that it does not touch the bottom of the cup.
10. Pour the mixture from step 5 (the **homogenate**) into the filter. After **10 minutes** a liquid, called the **filtrate**, should have collected at the bottom of the cup. Gently stir the mixture in the filter, then let sit for another minute. Remove the filter (there will still be material in the filter, but you do not need it) and set aside.

11. Tip the cup slightly and slowly add the alcohol to the cup with the filtrate until there are roughly equal volumes of filtrate and alcohol. The alcohol is less dense than the filtrate and will float on top of the filtrate.
12. Let the mixture sit undisturbed for about **5 minutes**. DO NOT shake or stir. Eventually a white material will become visible in the solution (**precipitate**). This is **DNA**.
13. Dip the stir stick into the liquid, slowly rotating it to pick up the strands of DNA.

**Key Terms:**

- **DNA:** Stands for Deoxyribonucleic acid. This is the hereditary material in cells that contains the instructions for producing the cell and enabling it to function.
- **Extraction:** A procedure to obtain a substance by chemical or mechanical action.
- **Filtrate:** The material collected after it passes through a filter.
- **Precipitate:** Solid material that comes out of solution as a result of a chemical or physical change.

**Questions:**

1. What is the role of the detergent?
2. What is the role of the salt?
3. What is the role of the alcohol?
4. Do you think you could extract DNA if you were to use a fruit or vegetable other than bananas? Explain.