

Strawberry DNA Extraction

Name _____

Pre-Lab Questions:

1. What do you think the DNA will look like?
2. Where is DNA found?

Objectives:

1. Identify the steps involved in extracting DNA from strawberries.
2. Explain the necessity and reason of each step in the laboratory.
3. Extract DNA from strawberries.
4. Explain why it is important for scientists to extract DNA from organisms.

Materials & Equipment:

Mortar & Pestle

1 strawberry

10 mL of DNA extraction buffer*

1 square of cheesecloth

1 Funnel

1 – 10 mL graduated cylinder (for DNA buffer)

1 – 50 mL graduated cylinder (for ethanol)

1 – Rubber band

1 – Test tube rack with 1 test tube

1 Glass rod

15 mL of cold ethanol

2 – glass vials with lids

Safety glasses

*Extraction buffer

Materials (100 ml)

- 10 ml of clear shampoo or dishwashing liquid detergent
- 1.5 g of table salt
- Distilled H₂O

Procedure (modify amount depending on the size of a class)

1. Mix 90 ml of distilled water and 1.5 g of salt.
2. Add shampoo/detergent until solution volume is 100 ml. Stir slowly to avoid foaming of the shampoo.

Procedure:

1. Put your safety glasses on before beginning.
2. Place one strawberry in the mortar. Use the pestle to smash and grind the strawberry for 2 minutes.
3. Add 10 mL of DNA extraction buffer to the mortar.
4. Use the pestle to again smash and grind the strawberry and the buffer together for 1 minute.
5. Assemble your filtration apparatus by placing the funnel into the test tube (in the test tube rack).

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Then place your cheesecloth on top of the funnel and secure it with a rubber band. Be sure that there is some give to the cheesecloth.

6. Pour the strawberry slurry into the filtration apparatus and let it drip directly into the test tube (pour slurry onto cheesecloth – slowly). You may have to use your glass rod to stir the slurry as it drips into the test tube.
7. When the slurry has dripped into the test tube, remove the funnel apparatus.
8. Slowly pour 15 mL of cold ethanol into the test tube. OBSERVE.
9. Dip the glass rod into the tube where the strawberry extract and ethanol layers come into contact with each other. OBSERVE.
10. Use the glass rod to remove the DNA from the test tube and put it into the glass vials (2). You will need to split the DNA between the two vials. Secure the lids on top with super glue.

Conclusions & Analysis

1. It is important that you understand the steps in the extraction procedure and why each step is necessary. Each step aided in isolating the DNA from other cellular materials. Match the procedure with its function.

Procedure

- A. Filter strawberry slurry through cheesecloth
- B. Mix strawberry with salty/soapy solution
- C. Initial smashing & 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 & dissolve cell membranes

2. What did the DNA look like? Describe it. Relate what you know about the chemical structure of DNA to what you observed today.

3. Explain what happened in the final step when you added ethanol to your strawberry extract. (Hint: DNA is soluble in water, but not in ethanol.)

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4. A person cannot see a single cotton thread 100 feet away, but if you wound thousands of threads together into a rope, it would be visible much further away. Is this statement analogous to our DNA extraction? Explain.

5. Why is it important for scientists to be able to remove DNA from an organism? List two reasons.

6. Is there DNA in your food? How do you know?