

Strawberry DNA Extraction Protocol

adapted from a protocol distributed by the American Society of Plant Biology

This activity utilizes the same basic principles to extract DNA as are utilized in molecular biology labs, demonstrates that our food contains DNA (a lot of it in the case of strawberries), and gives participants the chance to see how DNA looks (at least in its clear, gloppy form).

1. Place frozen strawberries in a plastic bag with a zippered top. Allow the strawberries to thaw. (Strawberries work well because they are easy to squash and contain a relatively large amount of DNA per nucleus. The attractive color and fragrance are added bonuses.)
2. Measure 500 mL of water into a separate container or measuring cup.
3. To the 500 mL of water, add 100 mL of shampoo. (Pantene ProV works well, although other brands can be used. Some versions of this protocol use dishwashing detergent.)
4. To the shampoo mixture, add 15 g of table salt.
5. Add water to make a total volume of 1 L of shampoo-salt mixture.
6. Gently mix the shampoo and salt into the water until completely dissolved. To prevent the formation of extensive bubbles, avoid vigorous mixing.
7. For each strawberry, add 15 mL of shampoo-salt mixture to the plastic bag.
8. Press most of the air out of the bag, seal it, and squash the strawberries.
9. Fold a piece of cheesecloth to create a stack of several layers. (Cheesecloth is a thin fabric with large holes, each about 0.25 cm^2 . Some people use coffee filters, though I find cheesecloth works better.)
10. Use a rubber band to secure the folded cheesecloth across the top of a large cup.
11. Filter the mashed strawberry mixture through the cheesecloth into the cup.
12. Remove the cheesecloth filter and strawberry pulp from the top of the cup.
13. Add an equal volume of 95% cold ethanol to the filtered, liquid strawberry extract by pouring the ethanol slowly down the side of the cup. (Keep the ethanol cold by putting it in the refrigerator or in a cooler on ice before use. If ethanol is not available, cold 91% isopropanol, or rubbing alcohol, may work, although perhaps not as well as the ethanol.)
14. DNA should precipitate at the interface of the red strawberry layer and the clear ethanol layer.
15. To recover the DNA, use a wooden barbecue skewer, glass Pasteur pipet, or similar slim rod to scoop or swirl the clear strands of DNA from the interface of the two liquid layers. (Alternatively, filtered strawberry extract from Step 11 can be combined with an equal volume of 95% ethanol in a clear 1.5 mL centrifuge tube. Mixing the tube by inversion will cause the DNA to appear as clear, stringy material within the tube.)