DNA extraction from strawberries

This is a classroom friendly DNA extraction from strawberries. It is safe, cheap and fun.

Materials for one extraction:

- Zip lock plastic bag
- 1 strawberry (fresh or defrosted)
- 10mL DNA extraction buffer
- Gauze, cut into squares
- Funnel
- Ice cold ethanol
- Plastic transfer pipette
- Clear test tube, plastic/glass
- Long wooden skewer

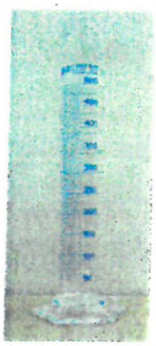
http://commons.wikimedia.org/wiki/Image:FraiseFruitPhoto.jpg

DNA extraction buffer:

Makes 50mL (enough for 5 extractions)

- 5 mL liquid dish washing detergent or shampoo
- 0.75g salt
- 45mL water

To make: Measure detergent and water in a measuring cylinder, weigh out the salt and combine ingredients into a labelled bottle or beaker.



http://commons.wikimedia.org/wiki/Image:Measuring_cylinder_hg.jpg

What to do:

1. Make the DNA extraction buffer following the method above.

2. Wash the strawberry, remove the sepals (the green leaves) and put it into a zip lock plastic bag. Add 10mL of the extraction buffer and seal the bag tightly, making sure any air bubbles are pushed out and crush the strawberries with your fingers on the bench surface for 1 minute.

Note: Do not crush the strawberries too much as this will cause the DNA to shear/degrade.

What is happening?

Crushing the strawberries breaks open many of the strawberry cells, releasing the nuclei where the DNA is.

The soap in the detergent or shampoo in the extraction buffer breaks down the fatty membranes of the cells, breaks open the nuclear membrane and releases the DNA into solution.

The salt makes the DNA molecules stick together, and separate from the proteins that are also released from the cells.

3. Place the funnel lined with gauze into the test tube.

4. Pour the strawberry DNA extraction buffer mixture into the gauze and filter the mixture into the tube through the gauze.

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5. Keep the liquid filtered into the tube in the tube and discard the gauze and the strawberry pulp.

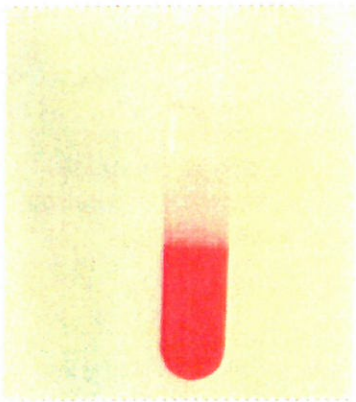
What is happening?

The gauze retains strawberry cell debris. The strawberry DNA is dissolved in the DNA extraction buffer, which will pass through the gauze into the test tube.

6. Layer an equal volume of ice-cold ethanol on top of the strawberry solution in the test tube using the plastic transfer pipette provided.

7. Observe what happens at the interface of the alcohol and strawberry solution when you twirl a long wooden skewer through the interface. Keep the tube still at eye level and do not shake it.

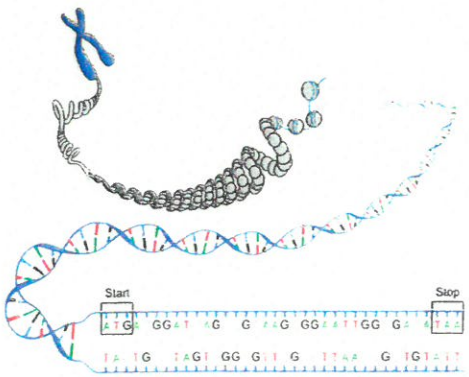
What are you seeing?



The DNA collects between the layer of alcohol on top and strawberry extract underneath!

DNA is insoluble in alcohol, so it precipitates. What you see is the precipitation of strawberry DNA - long, thread-like DNA molecules at the interface of the alcohol and DNA solution.

8. You can collect the DNA strands onto a wooden skewer. The whitish, gooey, stringy stuff is DNA containing strawberry genes! This contains the code for all of the proteins required by the strawberry throughout its life.



http://commons.wikimedia.org/wiki/Image:DNA_ORF.gif

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