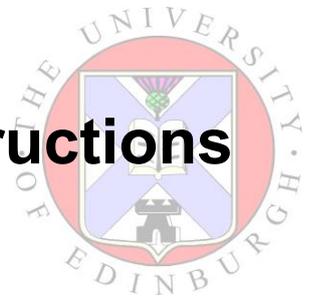


Extracting DNA – Teacher's Instructions

For Demonstration/Class Activity



Make Sure You Have...

250 ml beaker

50 ml beaker

Soap

Bicarbonate of Soda

Water

Tea Strainer

Teaspoon

Sample Vial

Dropper

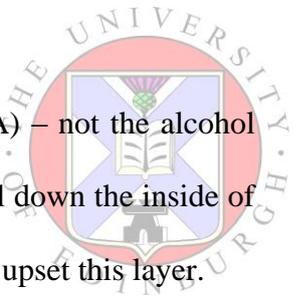
Cocktail Stick

Isopropyl Alcohol (IPA)

Tomato/banana that doesn't know what's about to hit it

What to do...

1. Make up a solution of a teaspoon of bicarbonate of soda, a quarter teaspoon of salt and a teaspoon of detergent in water (120 ml) in a 250 ml beaker (can make solution up in advance in bulk if desired).
2. Mash half a tomato through a tea strainer with a metal teaspoon into a beaker.
3. Add 20 ml of the soap mixture and stir to break open the cells.
4. Carefully sieve the tomato solution back through the tea strainer into a 50 ml beaker but don't push the solid material through.

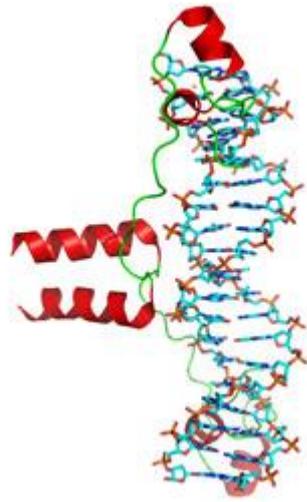


5. Carefully add a dropper full of ice cold alcohol (Isopropyl alcohol (IPA) – not the alcohol you drink but one used in windscreen wiper fluid). If you run the alcohol down the inside of the beaker it will form a layer over the tomato solution. Be careful not to upset this layer.
6. To get the DNA out, use a cocktail stick with a rough edge. Get the layers in your beaker at eye level and twizzle (*i.e.* go fishing!) the cocktail stick between the 2 layers. You are trying to pick up the DNA which is long and stringy and see-through. Put any DNA you find into a sample vial.
7. Wash everything up (Solutions can go down the sink. The IPA should really go in the organic waste but in the sort of volume you use here it's not really a problem down the sink).

What's Happening?

DNA (DeoxyriboseNucleic Acid) is the code for all proteins – it spells out whether the protein being made is that of hair, skin, blood etc. DNA is a long, stringy molecule. What you have done is extract DNA from the cells in a tomato. The soap solution breaks over the cell and the DNA falls out of the **nucleus**. The DNA then ends up in the solution and it can be precipitated out by adding the isopropyl alcohol.

Like proteins, DNA is also made up of building blocks and in EACH cell there are 6,000 million (3,000 million base pairs) of these building blocks. That is a lot to fit into each cell, so the DNA folds up like a spiral staircase.



DNA is coiled like a spiral staircase (called a helix)