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Biology at home: strawberry DNA extraction

Strawberry DNA extraction



All living things contain deoxyribonucleic acid or DNA. DNA contains the chemical instructions for organisms to make thousands of different proteins which, in turn, allow the organism to survive. It can easily be seen with the naked eye when collected from thousands of cells.

This simple method allows you to extract DNA in the comfort of your own kitchen.

The same method works well with kiwi fruit, but we are using strawberries which give a higher yield of DNA (thanks in part to each cell containing six copies of each section of DNA!).

An adult is required to supervise, especially during the steps involving alcohol.

You will need:

- Three Strawberries
- Zip-lock sandwich bags
- DNA extraction solution (mix one generous squirt of washing up liquid with about 30 ml of water and two heaped teaspoons of salt in a cup and stir until dissolved)
- Gauze or cheesecloth
- A rubber band
- Glass cups or beakers
- Strong alcohol (e.g. vodka), kept in the freezer!

Procedure:

1. Place a strawberry in a zip-lock bag. Remove most of the air before you seal the bag.

2. Use your hands to mash the strawberry through the bag. Try and squeeze it into as smooth a pulp as you can without breaking the bag.

This step helps to mechanically break down the tough cellulose wall around each cell.

3. Open the bag and pour in all of the DNA extracting solution. Re-seal the bag and mix thoroughly.

Detergents in the washing up liquid dissolve the fatty membranes around the outside of the cell and also the nucleus where the DNA is stored. The salt causes the DNA to clump together to make larger molecules in solution.

4. Place a piece of gauze over the opening of the cup, secured with a rubber band.

5. Carefully pour the strawberry mixture into the cup making sure to catch the solids with the gauze.

6. Add an equal volume of the cold alcohol to the strained mixture that has collected in the cup.

7. Look carefully at the line between the strawberry mixture and the vodka. What do you see? You should notice a white thread-like cloud appearing at this line.

This is strawberry DNA. DNA is soluble in water but insoluble in alcohol. Hence the DNA will clump together and float to the top of the alcohol layer. You can carefully fish it out using a kitchen skewer. It's incredible to think that each human cell has around two metres of DNA crammed into the nucleus!



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