

Simple extraction of DNA from living material

Introduction

DNA is the hereditary material found in all living things. In this practical you will extract the DNA from strawberries. Strawberries can have up to 8 copies of each chromosome and so contain a lot of DNA. When extracted from the strawberry this DNA is visible.

Apparatus

re-sealable plastic bag
 strawberry
 10cm³ washing up liquid (detergent)
 1 g sodium chloride
 100cm³ water
 2 × 250cm³ beakers (one beaker will be used for the filtering apparatus below)
 filter funnel
 coffee filter paper
 ice-cold 90% alcohol
 ice lolly stick or plastic coffee stirrer

Method

1. Remove the green top from the strawberry.
2. Put the strawberry into the plastic bag, seal it and crush for about 2 minutes.
3. In a beaker mix together 10cm³ of washing up liquid, 1 g of salt and 100cm³ water. This mixture is the DNA extraction liquid.
4. Add 10cm³ of the extraction liquid to the bag with the strawberry.
5. Re-seal the bag and gently mix the extraction liquid with the strawberry for 1 minute.
6. Place the coffee filter inside the beaker and gently pour the strawberry mixture into it.
7. Pour 10cm³ of ice-cold 90% ethanol down the side of the beaker into the strawberry mixture, do not mix or stir.
8. Within a few seconds you should see a white cloudy substance form in the clear layer above the strawberry mixture. Use a lolly stick to pull strands of this out of the top layer, this is the strawberry DNA.

Risk Assessment

Hazard	Risk	Control measure
90% ethanol could act as an irritant	Inhalation could cause irritation of the nose/throat	Use in well-ventilated area/wear safety glasses.
	Ethanol could touch skin during the experiment	Use gloves when pouring ethanol.

Teacher/ Technician notes

Chill the ethanol by keeping in the freezer for at least 2 hours or overnight. Keep on ice during the experiment.

A variety of fruits can be used as an alternative to strawberries, such as kiwi or banana, but check students have no allergies to the fruit used.

This experiment could be used as stimulus material to begin a piece of extended writing describing what was observed in the experiment and linking it to what the student already knows about the structure of DNA. It could also lead to a discussion of the ethical issues surrounding DNA.

Practical techniques covered

- B2 Safe use of appropriate heating devices and techniques including use of a Bunsen burner and a water bath or electric heater.
- B3 Use of appropriate apparatus and techniques for the observation and measurement of biological changes and or processes.
- B4 Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment.