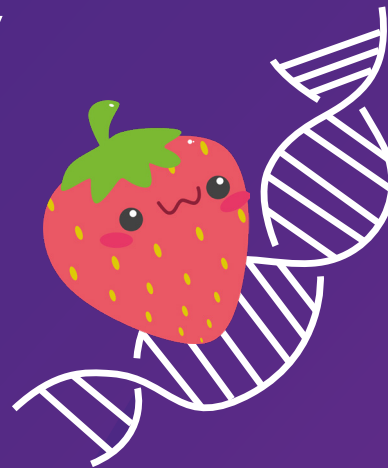




Strawberry DNA Extraction



All living things have DNA: the chemical instructions on how to make a living thing. Although you might think DNA is too small to be visible, it can easily be seen with the naked eye when collected from thousands of cells. This simple method allows you to extract DNA from a strawberry and actually see it.

What does DNA stand for?

DNA stands for deoxyribonucleic acid.

DNA is a long molecule in the shape of a double helix - two spirals twisting around each other. These spirals are the backbone of the DNA, and are made up of sugars and phosphates. The spirals are connected by chemicals known as bases, which stretch between the spirals like the rungs of a ladder. DNA has four types of bases: adenine (A), thymine (T), guanine (G) and cytosine (C). A and T always join together, as do G and C.



What does DNA do?

Our genes are made up of DNA, and DNA contains our unique genetic code. Like a recipe book or instructions for lego, DNA holds the instructions for making all our proteins, which do all the jobs in our bodies.

Genes in common

You don't look much like a fly or a worm. But, believe it or not, you share genes with both of them - and with every other living thing. Scientists study the genes in bacteria, fish, chimpanzees and other living things to learn more about humans.

How much DNA do you share with these living things?



Chimpanzee



Zebrafish



Fruit fly



Round Worm



Mustard grass

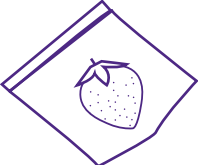


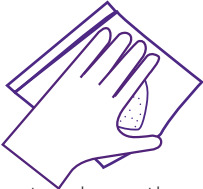
Bacteria


Materials

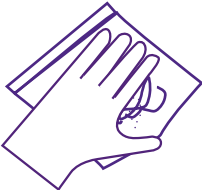
- Strawberries
- Zip-closure sandwich bag
- DNA extracting solution (mix about 1 tablespoon of dish detergent and 1 teaspoon of salt into 1 cup of water)
- Plastic cup
- Gauze, cheesecloth or coffee filter
- Rubber band
- Test tube (or smaller cup)
- Dropper (or spoon)
- Denatured alcohol e.g. methylated spirits or rubbing alcohol - put in the freezer for best results.
- Paper towels

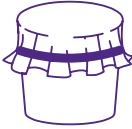
Procedure

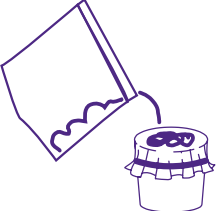
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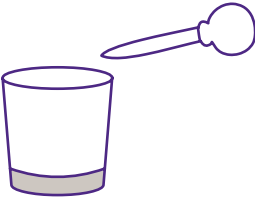
Place a strawberry in a zip-closure bag and remove most of the air before you seal the bag.
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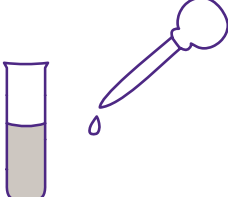
Mash the strawberry through the bag in your hand. Do not hit against the table as this might damage the DNA.
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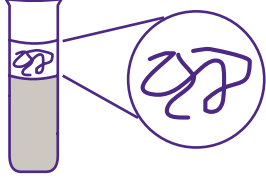
Add 2 tablespoons of the DNA extracting solution
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Continue mixing and mashing the bag in your hand.
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Place a piece of gauze over the opening of the cup, securing it with a rubber band.
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Carefully pour the strawberry mixture into the cup making sure to catch the solids with the gauze.
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Take a dropper or spoonful of the liquid in the cup and place in the test tube.
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Add a dropper for spoonful of the alcohol to the test tube. Take care not to tilt or tip the test tube; do not mix the two liquids.
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Observe the line between the strawberry mixture and the alcohol.

You will notice a white thread-like cloud appearing at this line. This is strawberry DNA. The DNA will clump together and float to the top of the alcohol layer.

Why do we use the dishwashing liquid?

The dishwashing liquid bursts open the cells of the strawberries, releasing the DNA.

Why do we use the salt?

It ensures that the proteins in the cell are kept separate from the DNA.

What does the alcohol contribute to the experiment?

When molecules are insoluble (unable to be dissolved), they clump together and become visible. DNA is not soluble in alcohol; therefore, the DNA strands clump together and become visible to the naked eye.

For further details, please visit:

Institute for Molecular Bioscience
www.imb.uq.edu.au