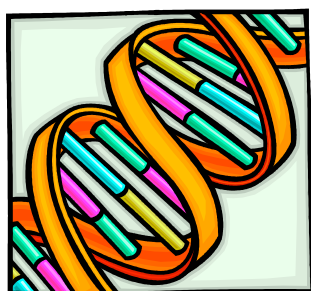


Isolation of Banana DNA

Background

D.N.A. stands for **d**eoxyribonucleic **a**cid and can be found in almost all animal cells and plant cells.

DNA is located inside the chromosomes, which are bodies found in the nucleus of every cell in the human body (except red blood cells and ova and sperm). DNA codes the form, location and function of all cells. The same DNA is in your foot, your finger nail, and your brain.



DNA is shaped in a double helix, much like a twisted ladder. The rungs pieces are nucleic acids. The four nucleic acids are (**T**) thymine, (**A**) adenine, (**C**) cytosine, and (**G**) guanine. **A** will always pair up with **T**, and **C** will always pair up with **G**. Chemically those are the only bonds that fit together correctly, giving DNA its specific structure. The pattern of these four nucleic acids is known as 'genetic code'.

DNA is a thread like substance that is wound tightly in the chromosomes. The sections of DNA that make each of us different are called genes. You inherit your genes from your parents.

The process of extracting DNA from a cell is the first step for many laboratory procedures in biotechnology. The scientist must be able to separate DNA from the unwanted substances of the cell gently enough so that the DNA does not break up.

What's going on?

In this experiment the banana's cell walls, cell membranes, and nuclear membranes are dissolved and broken apart by a detergent. The membranes are made out of fats or lipids. The detergent allows the DNA to be released from the cell. The meat tenderiser helps break down the proteins holding the DNA in it's tightly wound state and the bicarb prevents the solution becoming too acidic. The DNA floated out and into our solution.

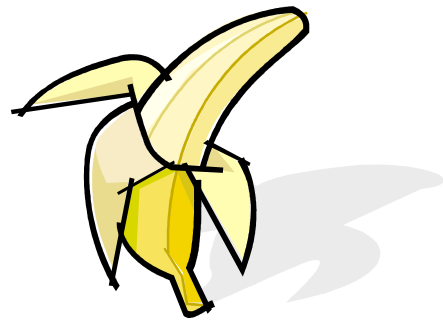
Isolation of Banana DNA

Equipment

- Foam cups
- A measuring jug
- Measuring spoons
- Plastic knife (to stir the mixture)
- Small strainer
- Funnel
- Test tubes
- A bent paperclip with a small hook at one end

Materials

- Warm water (around 60°C)
- A banana
- Liquid detergent
- Rubbing alcohol
- Baking soda
- Meat tenderiser



Method

1. Measure 100 ml warm (50-60°C) water.
2. Add 1/2 tablespoon of mashed banana to the cup, stir well.
3. Add 1/2 teaspoon of detergent and stir for one minute. The solution will become thick as the detergent separates the DNA from the banana cells.
4. Add 1/4 teaspoon of meat tenderizer and 1/2 teaspoon of baking soda. The meat tenderizer keeps the DNA intact and the baking soda keeps the solution from being too acidic.
5. Stir slowly for 1 minute, and then let the solution settle and cool for 4-5 minutes.
6. Pour the top half of the liquid through a strainer and funnel into a test tube.
7. Add ice-cold alcohol to the tube by pouring gently and let it sit for 1 minute. The DNA separates from the alcohol and moves to the bottom half of the tube. You should slowly see small filaments of DNA appear.
8. Use the bent paperclip to collect the DNA. You can store your DNA in alcohol in sealed containers or test tubes.

The DNA separates from the proteins and now appears as long filaments. It is these strands that give the genetic code responsible for creating these tasty fruit!