

## Extracting DNA in your kitchen

This experiment is reproduced from CSIRO's *The Helix* magazine.

All the information required to make you is stored in your DNA. In fact, the DNA in all organisms provides instructions about how to grow and how to go about millions of cellular processes every day. To find out more about DNA and what it does, researchers separate it from the rest of the cell. Isolating, or extracting, DNA can be done in about half an hour in your kitchen, but it took many years to learn how to do it the first time in the laboratory.

### You will need:

- an onion
- teaspoon of salt
- cup of washing up liquid
- meat tenderiser (available at chemists)
- chilled rubbing alcohol (isopropanol, available at chemists)
- warm water
- coffee filter paper
- toothpick
- knife and chopping board
- strainer
- blender
- small container
- glass container
- microscope or magnifying glass.

### What to do:

1. Peel and cut the onion into very small pieces. Stir the salt and warm water together in the blender, add the onion and chop for two seconds. The mixture should be lumpy with small pieces of onion in it. Transfer it to the small container, add the detergent and mix for five minutes. This will help break up the cell membranes.

2. Next, you need to separate the DNA and proteins from the rest of the cell components. Put the coffee filter in the strainer and filter some of the onion liquid into the glass container. Add 1/8 of a teaspoon of meat tenderiser to the mixture and gently stir with a toothpick for another five minutes. This removes the protein. Warm the milk over a medium heat in a saucepan to 43-46°C (avoid burning the milk).
3. Slowly and gently pour in an amount of alcohol to equal the amount of onion mixture. The alcohol should form a layer on top of the cell debris, and the DNA will precipitate through the alcohol. Stir the alcohol layer carefully with the toothpick. The clear, gooey substance is the DNA.
4. Examine the DNA under a microscope or magnifying glass.

### For further investigation

Try extracting DNA from broccoli, dried peas (the type used for split pea soup), yeast (available in the baking section of supermarkets), cod roe (fish eggs), bananas (without the skin) and liver (raw chicken or calf liver). Is the DNA from the different organisms the same?

What do scientists do with the DNA they extract?