

# Extract your own DNA

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This experiment allows you to extract your own DNA in your own home! You will need the help of an adult.

DNA is a complex molecule that is found inside cells. This molecule is so small that you can't normally see it with the naked eye, but if you release the DNA of thousands of cells at the same time, the molecules become visible because of their sheer number. In this experiment, you will collect some cells from the skin on the inside of your mouth, break the cells open, release the DNA and concentrate them in a liquid so you can see them.

## Gather the following household materials:

- 500 millilitres of drinking-water
- 1 tablespoon of cooking salt or table salt
- 1 clear cup or glass, small, with a narrow mouth
- 125 ml of chilled rubbing alcohol  
(Isopropyl alcohol USP 70%) \*
- A few drops of blue food colouring (optional)
- 1 eyedropper or 1 spoon
- 1 drop of clear dishwashing detergent
- 1 stir-stick
- Safety Glasses
- 1 pair rubber gloves



**Warning:** Rubbing alcohol is a hazardous substance. It must be handled by an adult. Protective eye-wear and gloves should be worn during the experiment. Use rubbing alcohol in a well ventilated area. Keep it away from open flames or sparks. Do not drink the rubbing alcohol. If ingested, call a Poison Control Centre. We recommend the using hygenic caution when handling the saliva.

**Step 1:** Add the salt to the water and stir until the grains of salt have disappeared. Pour 3 tbsp of the salty water into a cup.

**Step 2:** Gargle and swish all the salty water from the cup around your mouth. Do not swallow the water. Spit it back into the cup.

**Step 3:** Dip the stir-stick in the drop of dishwashing detergent and gently stir it in the cup. Less froth in the cup is better so stir only two or three times.

**Step 4:** Add two or three drops of food colouring to the rubbing alcohol if you want, and stir well. The blue food colouring will help you distinguish the alcohol from the water.



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**Step 5:** Use the eyedropper to dribble the rubbing alcohol down along the inside wall of the cup. Try to add the alcohol very gently, so that the water and the alcohol do not mix. You want the alcohol to form a separate layer on top of the water. It helps to hold the cup at about a 20-degree angle while you do this.

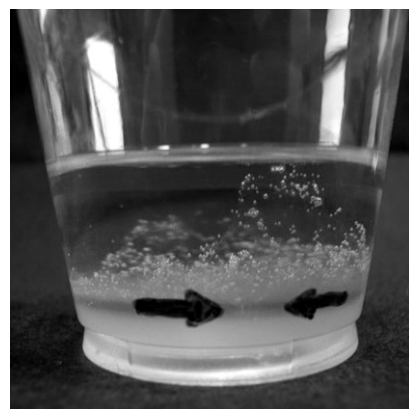
If you don't have an eyedropper you can use a spoon. Hold the spoon with its back facing upwards just above the surface of the water and with its tip touching the side of the cup. Dribble the alcohol onto the back of the spoon so that it slides gently off the spoon, down the side of the cup, and onto the surface of the water.

Pour enough rubbing alcohol to create a 2 cm-high layer on top of the water. Even if you added the food colouring to the alcohol, the water will remain transparent.



**Step 6:** Watch the thin strands of DNA collect together in the alcohol. The strands link together and form nets or webs of DNA. Take a good look—it's a part of you that you usually don't get to see! If the alcohol is cloudy, try the experiment again and add the alcohol more slowly.

**Step 7:** Discard the contents of the cup. Clean up and put everything away in its place.



## What happened?

The skin cells inside your mouth were easily removed by gargling and swishing the water in your mouth. Salty water was used because it mimics the salty fluids inside our bodies. Our cells are protected by "walls" that are really a fatty layer called a membrane, but when you added the drop of detergent you broke open the cell membrane and the DNA was released into the water. When the alcohol layer was added the DNA strands gradually migrated into it and joined to other DNA strands. As more and more strands stuck together, the DNA became visible to the naked eye. Isn't it amazing that such tiny molecules hold all the information to make you so unique?

Learn more about DNA on The Gee! in Genome Web site at <http://nature.ca/genome>.