

NEATH PORT TALBOT COLLEGE COLEG CASTELL NEDD PORT TALBOT

School of Maths & Science Science Practical

Genes in a Bottle **(Extraction of cheek cell D.N.A.)**

◆ Aim

In this experiment you will extract your own DNA from your cheek cells, collect the DNA and save your DNA in a glass pendant.

◆ Introduction

Deoxyribo Nucleic Acid **or** DNA, contains the instructions for making you. It determines how you look, what blood type you have, even your tendency to get some diseases. It is found inside the nucleus in just about every single cell of your body. In our experiment today, you will break away the membranes around your cheek cells and their nuclei so that you can see your very own DNA!!!

◆ Safety

Control Measures

- The wearing of **safety goggles** and a **laboratory coat** at all times will be sufficient to take account of most hazards and significant risks.
- Ethanol is harmful by inhalation and in contact with the skin, avoid inhalation and contact with skin.
- Keep flammable liquids away from sources of ignition.
- All waste is to be placed in the labelled container immediately after use.
- You are reminded of the need for good laboratory practice in order to maintain a safe working environment.

Hazards

Highly Flammable

Ethanol

Harmful

Ethanol
Protease enzyme



◆ Procedure

Steps 1 and 2: Collecting and breaking open cells

To collect as many cheek cells as possible, you will gently chew the insides of your mouth for 30 seconds and then rinse your mouth with a small amount of water. Ample cell collection is critical for success. For best results, make sure you spend the recommended amount of time collecting the cells.

1. Obtain a 30cm³ cup containing a 3 cm³ of water, and label it with your initials.



2. Gently chew the insides of your mouth for 30 seconds.
It is NOT helpful to draw blood!

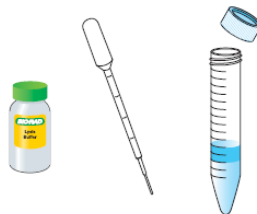
3. Take the 3 cm³ of water from your cup into your mouth and rinse vigorously for 30 seconds.
Don't swallow the water!



4. Carefully expel all your water mouthwash back into your 30 cm³ cup.
5. Carefully pour the water mouthwash from the cup into a 15cm³ tube and label this tube with your initials.



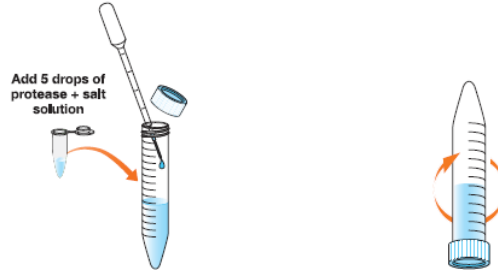
6. Obtain the tube of lysis buffer from your workstation, and add 2 cm³ of lysis buffer to your tube.



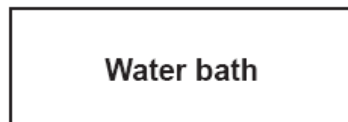
7. Place the cap back in your tube. Gently invert your tube 5 times to lyse your cells.
Don't shake the tube. If you observe any changes to your cells at this time, write them down.

Step 3: Removing proteins

1. Obtain the pink tube labelled “prot” and add 5 drops of protease and salt solution to the 15 cm³ tube containing your cell extract. Cap the cell extract tube and gently invert it 5 times to mix.



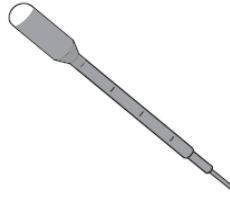
2. Place your cell extract tube in the beaker or test tube holder in the 50°C water bath for 10 minutes to allow the protease to work.



50°C for 10 min

Steps 4 and 5: Making the DNA visible

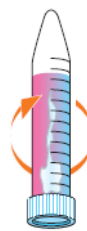
1. Fill a disposable transfer pipette with cold ethanol.



2. Tilt your 15 cm³ tube at a 45° angle and slowly add the ethanol, carefully letting it flow gently down the inside of the tube. Fill the tube with cold ethanol (about 10 cm³ total). You may need to use several pipettes full of cold ethanol. You should be able to see two layers (upper and lower) forming. As you add the ethanol, pay close attention to the place where the ethanol and cell extract layers meet. Write down your observations.



3. Place your 15 cm³ tube upright in a test tube rack and leave it undisturbed at room temperature for 5 minutes.
4. After 5 minutes, look again at the contents of your tube, especially in the area where the ethanol and cell extract layers meet. Do you see anything? Write down your observations. Compare your sample with those of your classmates.
5. With the cap of your tube tightly sealed, mix the contents of your tube by slowly inverting the tube 5 times. Look for any stringy, white or clear material.
This is your DNA!



6. With a disposable plastic transfer pipette, carefully transfer the precipitated DNA along with some ethanol solution into the vial (fill the vial to the start of the neck). Your teacher will help you seal the vial so you can complete the necklace.

