Human Cheek Cell DNA Extraction

How can DNA, a submicroscopic molecule, be visualized with the naked eye?

What must be done to extract and isolate DNA from human cheek cells?

What can we conclude about the chemical nature of DNA through isolation techniques?

Materials

15 mL test tubes, small disposable cups, sports drink, 70 percent ethanol, disposable plastic pipettes, cell lysis (detergent) solution, 1.5 mL microcentrifuge tubes and test tube racks, colored string.

Procedure

The students will:

1. Obtain a 15mL test tube and label it with the student's name.
2. Obtain a small cup of sports drink and swish it around in mouth for *one full minute*. While swishing, they should gently and continuously scrape the sides of their cheeks with molars.
3. Spit the drink (with the collected cheek cells) back into the small cup.
4. Pour the contents of the cup into the labeled test tube (discard the cup).
5. Holding the test tube at an angle, they will use the provided plastic pipette to add 2mL of detergent solution to the collected cheek cells.
6. Cap the test tube, and invert it five to eight times.
7. Allow this to stand for two minutes.
8. Using the provided pipette, add the cold alcohol by letting it run gently down the side of the test tube (holding the test tube at an angle). Add the alcohol until the total volume reaches 12–13mL. They should have two distinct layers. The students should NOT mix the cheek cell solution with the alcohol!
9. Observe as strands of a translucent solid begin to precipitate where the alcohol layer meets the cheek cell solution.
10. Place the 15mL test tube in a test tube rack and let it stand undisturbed for 15 minutes. During this time the solid will continue to precipitate out.
11. Use a plastic pipette to transfer the solid DNA into a smaller test tube. To do so, the students should place the pipette near the DNA and draw the DNA into the pipette (along with some alcohol). They should NOT move the pipette up and down into the bottom layer.