

## SCIENCE LAB PREP WORK

**LAB DATE:** January 28, 2008

**LAB TITLE:** Human DNA Extraction

### INTRODUCTION:

“Look at yourself in a mirror and reflect upon the fact that you are beholding ten thousand trillion cells, and that almost every one of them holds two yards of densely compacted DNA, and you begin to appreciate just how much of this stuff you carry around with you...Yet DNA is not alive.” – Bill Bryson

DNA, deoxyribonucleic acid, provides the blueprint for the assembly of proteins and is ultimately responsible for directing the structure and function of all cells. It is passed on from generation to generation. In this lab you will collect some cells, break the cells and nuclei open (lyse) to release the DNA, and concentrate (precipitate) the DNA so that you can see it.

**PURPOSE:** To understand how DNA can be extracted from cells.

### MATERIALS & EQUIPMENT:

- 92 ml distilled water
- 8g salt
- Cold 91% Isopropyl Alcohol
- Detergent solution
- 2 Pipettes
- 2 Test tubes
- 2 Test tube stoppers
- 2 30 ml Cups
- 2 Wooden stirring rods
- Safety glasses
- Gloves
- Watch or stopwatch

## PROCEDURE:

1. Prepare an 8% salt solution by adding 8g of salt to 92ml of water. Be sure to dissolve the salt completely in the water by stirring it with a wooden stirring rod.

The remaining steps in the procedure will be carried out by each student individually.

2. Fill a cup with 30ml of the salt solution.
3. Take the salt water and violently swish it in your mouth, making sure to rub your tongue along your cheeks. **DO NOT SWALLOW.** Do this for 30 seconds before spitting the water back in the cup.
4. Fill a test tube half way with the water from the cup.
5. Carefully add ten drops of soap solution using a pipette.
6. Place the stopper on the test tube and rock it gently back and forth for one or two minutes.
7. Add enough cold alcohol to almost fill the test tube by dripping the alcohol gently down the wall of the test tube using a pipette. **DO NOT TIP, SHAKE, OR MIX THE TEST TUBE.**
8. Watch the line of separation between the alcohol and the water. You will start to see bubbles attached with tiny hair-like white strings. This is your DNA. Draw what you see.
9. Using a wooden stirring rod, spool the DNA by slowly twisting the stirring rod as you lift it out of the test tube.

## QUESTIONS TO CONSIDER:

1. What cells did you collect?
2. Why did you use salt water?
3. What did the soap solution do?
4. What did the alcohol do?
5. In your own words, describe the structure of DNA and explain what its function is.

## WEB LINKS:

<http://gslc.genetics.utah.edu/units/basics/index.cfm>

<http://www.pbs.org/wgbh/nova/genome/>

<http://genetics.gsk.com/kids/dna01.htm>