

KITCHEN GENETICS

What is DNA?

DNA is the molecule that stores genetic information in a cell. The DNA in a cell is called a genome and it is made up of long strings of nucleotides (A, T, C, G), which are the building blocks of life. The process of removing a genome from a cell so that it can be analyzed is called DNA extraction. You can extract DNA using basic supplies found in an ordinary kitchen.

DNA EXTRACTION PROTOCOL

Supplies:

- Ice cold high proof alcohol (>75% ethanol)
- Frozen strawberries
- Pineapple juice
- Plastic bags that zip closed
- Spoon
- 50 ml falcon tubes
- Toothpicks

Instructions:

1. Thaw the strawberries, or heat them in microwave and then cool
2. Seal the strawberries in a plastic bag together with some pineapple juice and mash them up
3. Use a spoon to put some mashed strawberry into a falcon tube
4. Add ice cold alcohol and gently swirl - the DNA will start to appear
5. Use toothpick to pick up and examine the strawberry DNA

How does it work?

Wow - you extracted DNA! How did it work? Plants contain very large amounts of DNA. The strawberry genome is 805 million nucleotides long and every cell has 8 genome copies - for a total amount of 6.44 billion nucleotides of DNA in every strawberry cell! That's a huge amount - if you could line up all the DNA in just one strawberry cell, it would stretch more than 2 meters tall!

Although there is so much DNA in a cell, usually you can't see it. That is because DNA is normally wound up very tightly around proteins called histones. When DNA is wrapped around histones, it is invisible to the naked eye. Pineapple juice contains an enzyme called **bromelain** that can break down histones. When this happens, the DNA is released into solution, where it then uncoils and expands. Adding alcohol causes the DNA to precipitate and become visible to the naked eye.

By extracting DNA in this manner, you can "see" the DNA inside every tasty bite of strawberry!

