

Strawberry DNA Extraction Lab

You've probably learned or heard about DNA, but have you ever seen it? With the Strawberry DNA experiment, you'll extract, isolate, and observe the DNA of a strawberry in a matter of minutes. It sounds impossible, but thanks to special characteristics of strawberries, it's actually very possible... and simple. You don't have to be a geneticist. You don't need a microscope. It's easy, fun, and all you need are some household materials.

Materials

- Strawberry
- Isopropyl alcohol (5 mL)
- Dish soap (10 mL)
- Salt (1/4 tsp)
- Zipper-lock bag
- Sieve
- Water (90 mL)
- Measuring utensils
- Beakers or similar containers
- Tweezers
- Pipette (optional)
- Spoon

Experiment

- 1 Put a bottle of isopropyl alcohol in a freezer. We'll come back to it later.
- 2 Measure 90 mL of water into a beaker or similar container.
- 3 Pour 10 mL of dish soap into the 90 mL of water.
- 4 Add 1/4 tsp of salt to the liquid in the beaker.
- 5 Mix it all up and now you've got a homemade extraction solution!
- 6 Place one strawberry in a plastic zipper-lock bag.
- 7 Pour your extraction solution into the bag with the strawberry.
- 8 Remove as much air from the bag as possible and seal it.
- 9 Use your hands to mash, smash, and mush the strawberry inside of the bag until there are no large pieces remaining.
- 10 Pour the resulting strawberry and extraction solution mixture through a sieve and into a beaker or similar container.
- 11 Use a spoon to press the strained bits of strawberry against the sieve, forcing even more of the solution into the beaker.
- 12 From the container it is currently in, transfer the solution into a smaller beaker or similar container that holds around 50-100 mL of fluid.
- 13 Add 5 mL of your chilled isopropyl alcohol to the solution and hold the mixture at eye level.
- 14 Can you see how there is a separation of white "stuff" atop the rest of the solution? That's the DNA of the strawberry.
- 15 Gently remove the DNA from the solution using tweezers.

How Does It Work?

Whoa! Did you know that DNA is in the food you eat? The long thick fibers you pull out of the extraction solution are strands of strawberry DNA. DNA is present in every cell of all plants and animals and determines the genetics of the individual organisms.

While other fruits are soft and just as easy to pulverize, strawberries are the perfect

choice for a DNA extraction lab for two reasons: they yield more DNA than any other fruits, and they are octoploid, meaning that they have eight copies of each type of DNA chromosome. These special circumstances make strawberry DNA easy to extract and see. (Human cells are generally diploid, with only two sets of chromosomes.)

To extract the DNA, each component of the extraction solution plays a part. The soap helps to dissolve the cell membranes. The salt is added to break up protein chains that hold nucleic acids together, releasing the DNA strands. Finally, DNA is not soluble in isopropyl alcohol, and even less so when the alcohol is ice cold.