



DNA Extraction Protocol



Materials

- 120mL of distilled water (bottled water works well)
- 1 tsp baking soda
- ¼ tsp salt
- 1 tsp shampoo or laundry detergent (look for ingredients like "Sodium Lauryl Sulfate" or "Sodium Laureth Sulfate")
- 1 Ziploc® bag
- 2 or 3 strawberries (or the DNA source of your choice - try bananas, cheeses,)
- 1 narrow glass cylinder (a shot glass works nicely)

Step 1: Prepare the Buffer

- In a clean glass container, combine 120mL of distilled water, ¼ tsp of salt, and 1 tsp of baking soda.
- Stir well until all of the ingredients have dissolved.
- Stir in 1 tsp of shampoo.
- Add 1 or 2 drops of contact lens solution (or meat tenderizer) to the mixture.

Step 2: Isolate the DNA

- In a Ziploc® bag, mash the strawberries and a small amount of distilled water into a mush.
- Place 1 tsp of the mashed fruit into a clean container.
- Mix 2 tsp of the chilled buffer liquid from *Step 1* into the mashed fruit.
- Gently swirl the mixture for 2 minutes.

Step 3: Filter the DNA

- Place a coffee filter over a clean container.
- Pour the fruit and buffer mixture from *Step 2* onto the filter.
- The result should be a clear liquid, free of any pulp from the fruit.

Step 4: Extract the DNA

- Pour 1 tsp of the liquid from *Step 3* into a narrow glass container.
- Carefully pour 1 tsp of chilled rubbing alcohol into the narrow glass container.
- The alcohol will float on top of the buffer liquid.
- A material will appear between the two layers of alcohol and the buffer solution.
- This material is DNA.

What is happening?

The liquid prepared in *Step 1* is called a "buffer." The chemicals contained in the buffer will break apart the outer structure of cells and allow the DNA inside to be released into the liquid.

What is happening?

Mashing the strawberries and placing them in the liquid from *Step 1* allows the buffer to reach all of the cells, break them apart, and release the DNA.

What is happening?

Pouring the mixture from *Step 2* through the coffee filter separates out all of the unwanted fruit pulp and cell remains, leaving only the DNA in the final solution.

What is happening?

Because the rubbing alcohol weighs less than the buffer liquid it will float on top of the buffer. At the point where the two liquids meet, the alcohol will reduce the salt concentration of the buffer and allow the DNA molecules to stick and clump together.