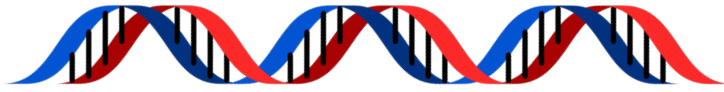




DNA extraction



Please assemble the following supplies for our Skype A Scientist experiment.

Consumables

- 2-5 strawberries (fresh or thawed from frozen)
Kiwi or banana will also work
- 1 quart-sized resealable plastic bag (e.g., Ziploc)
- 1/2 cup of 99% isopropyl alcohol
Note: 70-95% isopropyl or ethyl alcohol will also work. You will need a way to keep this frozen until use with a freezer or a bowl/bucket of ice.
- 1/2 cup of cold water
- 1/2 teaspoon of Kosher or table salt
- 2 tablespoon of liquid dish washing detergent
- Optional: 1/8 teaspoon of meat tenderizer OR pineapple juice OR lens cleaning solution

Equipment

- Qtip, wooden skewer, coffee stirrer, or straw
- Funnel with cheesecloth, small strainer, or coffee filter
A rubber band or hair tie may help
- 1 tablespoon, 1 teaspoon, and 1 measuring cup
- 2 plastic or glass cups
Ideally one cup is tall, narrow, and transparent. Plastic or glass test tube will also work if you have a stand or an extra set of hands.
- Towel for spills

Adapted from:

- 1) <https://omsi.edu/sites/all/FTP/files/chemistry/NH-PDF/NH-C19-DNAExtraction.pdf>
- 2) <https://learn.genetics.utah.edu/content/labs/extraction/howto/>
- 3) <https://www.scientificamerican.com/article/squishy-science-extract-dna-from-smashed-strawberries>
- 4) <https://www.genome.gov/Pages/Education/Modules/StrawberryExtractionInstructions.pdf>
- 5) <https://www.childrensmuseum.org/blog/real-science-strawberry-dna-extraction>

Brooke Wolford, PhD
bwolford@umich.edu

Experimental Protocol

(this is like a recipe)

Before the experiment, thaw your fruit if frozen, and place the ethanol or isopropyl alcohol in the freezer.

1. **Harvest Cells.** Remove the green tops from the strawberries. Place them in a bag and seal it shut. Use your hands to squish them into a pulp.
2. Create extraction buffer in a measuring cup or large cup. Mix 1/2 cup of cold water, 2 tbsp of detergent, 1/2 tsp of salt. Optional to add meat tenderizer or alternative.
3. **Cell lysis.** Slowly pour extraction buffer into the bag and reseal it. Knead the strawberries until the mix is the consistency of a smoothie. Try to minimize making soap bubbles, so keep shaking to a minimum.
4. Assemble a strainer, cheesecloth with funnel, or coffee filter above your transparent cup. Pour the mix in your bag through to filter out chunks of strawberries.
5. **DNA precipitation.** Hold your cup at a 45° angle and slowly pour in 1/2 cup of cold isopropyl alcohol down the side of the cup. Let sit for a few minutes. Swirl gently. Use your skewer or other tool to fish the DNA out of the mixture.