

CURIOSITY AT HOME

DNA EXTRACTION (PAGE 1 OF 2)



Use common kitchen items to extract DNA from fruits & veggies.

MATERIALS

- fruit or vegetables
- blender or food processor
- salt
- dish detergent
- toothpicks
- meat tenderizer
- test tubes or similar
- strainer
- measuring cups
- bowl
- microscope (optional)
- isopropyl (rubbing) alcohol (refrigerated is better though not necessary)

PROCEDURE

- Place 1 cup cold water, $\frac{1}{4}$ teaspoon salt, and $\frac{1}{2}$ cup of fruit or vegetable in blender.
- Blend for 5-15 seconds (more time for firm veggies). You want to create a soup-like texture.
- Strain the mixture into a small glass jar.
- Add 2 tablespoons of liquid detergent to the strained mixture and swirl the jar to mix the soap well without creating any suds.
- Let the mixture sit for 5-10 minutes
- Pour the mixture into test tubes (small, clear plastic cups work).
- Add a pinch of meat tenderizer and gently stir or wet a toothpick, dip it in the meat tenderizer and stir it into the mixture. Stir gently.
- Carefully pour alcohol into each test tube (or plastic cup). Ideally, you should pour the alcohol down the side so that it forms a clear layer above your "soupy" mixture. Add about as much alcohol as you have mixture.
- Watch as the DNA precipitates out of solution (the mixture). Little bubbles will form and rise to the top. The DNA will attach to these bubbles. If you gently stir the alcohol layer with a toothpick or a small hook (try a paperclip), you will see some slime-like, stringy stuff near the top. This is the DNA.

Experiment continued on next page...



2 tbs liquid detergent



Strained mixture in jar



alcohol (same amount as mixture)



Mixture in cup



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TRY THIS

If you have access to microscopes and clean slides, look at the DNA under magnification. Try different fruits and vegetables: which yield the best results? Does it matter if the fruit or vegetable matter is cooked first?

DID YOU KNOW

Blending breaks up the vegetable or fruit into smaller pieces but doesn't necessarily break open individual cells. The detergent bonds with certain components (lipids) within the cell membrane, breaking open the cell and allowing everything in the cell to spill out. However, the DNA is still interwoven around proteins for protection and structure. The enzymes in meat tenderizer cut those proteins, allowing the DNA to separate. The alcohol floats on top because it is less dense. The DNA is also less dense? so it rises to the top whereas most of the rest of the cell stays in the water/soap mixture. The DNA precipitates because it is insoluble (won't dissolve) in alcohol.



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