How to Extract DNA from ANY Living Thing

https://learn.genetics.utah.edu/content/labs/extraction/howto/?em_x=22

The directions for this experiment are using split peas but you can use anything living (ex. bananas, strawberries, blueberries, tomatoes, chicken liver, etc)

Step 1: Blender Insanity!

Put in a blender:
½ cup of split peas (100mL)
1/8 teaspoon table salt (less than 1 mL)
1 cup cold water (200 mL)

Blend on high for 15 seconds.
The blender separates the pea cells from each other, so you now have a really thin pea- cell soup.

Step 2: Soapy Peas

Pour your thin pea-cell soup through a strainer into another container (like a measuring cup)
Add 2 tablespoons liquid detergent (about 30 mL) and swirl to mix.
Let the mixture sit for 5-10 minutes.
Pour the mixture into test tubes or other small glass containers, each about 1/3 full.

Step 3: Enzyme Power

Add a pinch of enzymes to each test tube and stir gently. Be careful! If you stir too hard, you'll break up the DNA, making it harder to see.

Use meat tenderizer for enzymes. If you can't find tenderizer, try using pineapple juice or contact lens cleaning solution.

Step 4: Alcohol Separation

Tilt your test tube and slowly pour rubbing alcohol (70 – 95% isopropyl or ethyl alcohol) into the tube down the side so that it forms a layer on top of the pea mixture. Pour until you have about the same amount of alcohol in the tube as pea mixture.

Alcohol is less dense than water, so it floats on top. Look for clumps of white stringy stuff where the water and alcohol layers meet.

What is that Stringy Stuff?

DNA is a long, stringy molecule. The salt that you added in step one helps it stick together. So what you see are clumps of tangled DNA molecules!

DNA normally stays dissolved in water, but when salty DNA comes in contact with alcohol it becomes undissolved. This is called precipitation. The physical force of the DNA clumping together as it precipitates pulls more strands along with it as it rises into the alcohol.

You can use a wooden stick or a straw to collect the DNA.

Discussion (Major GRADE)

1. What does DNA from the strawberry (or whatever organism we used) look like?

2. Why might a scientist want to extract DNA from a cell? What applications does DNA extraction have in the real world?

3. What is the role of detergent, ethanol, and salt in the extraction process?

a) Detergent:
b) Ethanol:
c) Salt:
d) Meat Tenderizer:

4. Is there DNA in your food? How do you know? Why are you not harmed (or altered) by ingesting the DNA of another organism?

5. How is the DNA of a strawberry similar/different than that of a hamster?

6. What process within the cell cycle is essential for the information to get to every cell in the strawberry? (Hint: more *specific than mitosis*)