

Activity: DNA Extraction

Introduction:

As the blueprint for life, DNA is present in all living things. It can be easily extracted from split peas using materials from around the house, although other DNA sources may be used, including spinach, chicken liver, strawberries, and broccoli. The cells must be separated and burst before their DNA may be precipitated out of solution.

Objective: To extract DNA from split peas.

Materials:

½ cup split peas (100 mL)

⅛ teaspoon table salt (less than 1 mL)

1 cup cold water (200 mL)

2 tablespoons liquid detergent (30 mL)

Pinch of enzyme powder (can use meat tenderizer, pineapple juice, or contact lens cleaning solution)

Rubbing alcohol (70-95% isopropyl or ethyl alcohol)

Blender

Strainer

Measuring cup

Test tubes

Procedure:

Step 1: Blend split peas, table salt, and cold water in blender on high for 15 seconds. This separates the pea cells from each other, yielding a thin pea soup.



Step 2: Pour the pea-cell soup through the strainer into the measuring cup. Add liquid detergent and swirl to mix. Pour the mixture into test tubes, each about ⅓ full.

Step 4: Add enzyme powder to each test tube. Stir gently! If you stir too hard, you will break up the DNA and make it harder to visualize.

Step 4



Step 5: Tilt the test tube and slowly pour rubbing alcohol into the tube so that it forms a layer on top of the pea mixture. Pour until there is approximately as much alcohol as there is pea mixture.

Step 6: Alcohol is less dense than water, so it floats overtop of the peas. DNA normally stays dissolved in water, but when salty DNA comes into contact with alcohol, it precipitates out of solution. Clumps of white string DNA will thus appear where the two layers meet! You can use a wooden stick or a straw to collect the DNA from the tube.

Finish

