



■ This experiment will show you how to extract DNA from any living thing. Every living thing contains DNA – DNA is like a plan for life. For your experiment you may use different sources of DNA, such as peas, spinach, broccoli, onions or tomatoes.

EASY "PEASY" DNA

VOCABULARY BOX	
blender	Mixer
strainer	Sieb
mortar and pestle	Mörser and Pistill
grains	Körnchen
to stir	umrühren
layer	Schicht
to float	hier: schwimmen
clumps	Klumpen
entangled	hier: verwickelt
to twirl	hier: aufspulen
to disrupt	aufbrechen
stringy	klebrig
to be dissolved	gelöst sein



YOU WILL NEED:

- ➔ 100 g of peas
- ➔ ½ teaspoon of table salt
- ➔ 50 ml cold water
- ➔ Ice cubes
- ➔ Blender
- ➔ Washing-up liquid
- ➔ Washing powder (mild detergent)
- ➔ Rubbing alcohol (ethanol)
- ➔ Measuring cup
- ➔ Strainer
- ➔ Small glass containers
- ➔ Wooden stick
- ➔ Thermometer
- ➔ Pot

HOW TO EXTRACT DNA FROM PEAS:

Chill the alcohol by placing it in the freezer for a few hours (preferably overnight). First, put the peas into the blender.



Now prepare 50 ml of cold water in your measuring cup. Add the table salt and about 5 ml of washing-up liquid. Swirl to

mix and pour the solution in your blender. Make sure you close the lid tightly. Make a thick mash by firmly blending the mixture for 15 seconds. (If you do not have a blender, you can also use a mortar and pestle.) Let the mixture settle for 10 to 15 minutes in a water bath at 60 °C before putting it on ice for a few minutes.



Now pour your mixture through a strainer into another container. Add a few grains of mild detergent and stir gently. Pour the mixture into small glass containers, make each about one third full.

Tilt your glass and slowly pour the cold rubbing alcohol into the glass down the side so it can form a layer

on top of the pea mixture – about the same volume as you have of pea mixture. Alcohol (ethanol) is less dense than water, so it floats on top. Now look closely at the ethanol layer. Can you see the white “stringy stuff” where the alcohol and the water layer meet? What you see are white clumps of entangled DNA molecules. Collect the DNA by twirling a wooden stick and “spooling” the DNA onto the stick.



WHAT HAPPENED?

The blender separates the pea cells from each other. The detergent disrupts the cell membranes and the nuclear membranes. The salt helps the DNA to precipitate (clump together) when it meets the ethanol. DNA is a long, stringy molecule and normally stays dissolved in water. When salty DNA comes in contact with ethanol, it precipitates (becomes undissolved).

SOURCES/LINKS:

<http://learn.genetics.utah.edu>
www.fdb.uni-bonn.de/fdb/

DP

