

DNA ISOLATION FROM TOMATO

Isolating DNA from cells is the first step in the majority of molecular biological research. Reading the genetic code, detecting genes, modifying DNA of plants or bacteria: everything starts with DNA isolation. As an example we will show you how DNA can be isolated from ordinary fruits by simple materials (so you could try doing this at home!).



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How does this actually work?

First, we need to open up the plant cells. We do this by breaking the cells (mixing). We also have to destroy the membranes that surround the cell and nucleus (where the DNA is), which will be achieved by treatment with a solution that contains a detergent. By adding salt to that solution, the proteins will be separated from the DNA. We will remove the cell debris by filtration. Afterwards, we can precipitate the DNA with alcohol: the salt makes the DNA less polar and, as a consequence, the DNA will precipitate. The end result is a bunch of fine threads, that are all tangled up, and are visible in the solution. This is actually because the DNA still contains a bit of pigments that were not removed during the process.

Protocol:

1. Cut (part of) the fruit in small pieces and put those into a beaker
2. Make a solution of
 - 5 mL dish wash detergent
 - 1 teaspoon salt
 - 45 mL water
3. Put this solution in the beaker that contains the fruit
4. Mix briefly (15/30 seconds)
5. Make a 'filter' with paper-towel and put into a funnel
6. Filtrate the tomato/banana/blueberry solution. The filtrate contains the DNA!
7. Make the DNA visible:
 - Bring 0,25 mL of the filtrate into an eppendorf
 - Add 0,5 mL isopropanol (but any alcohol will do: vodka or whisky also work!)
 - Invert the tube gently
 - You will see the DNA appearing as threads that are all tangled up!