

DNA EXTRACTION

Protocol for Students (per student pair)

Materials

- 1 liter Zipper bag (one per student pair) with 20 ml of extraction buffer
- Skinned and freshly cut kiwi fruit (each fruit cut into 12 pieces) or one large strawberry, allocate ~ 30 g per student pair
- 500 ml Beaker (class)
- Hot water plate with beaker or saucepan of water set at a constant 60° C (class)
- Cheese cloth (cut to fit over small beaker)
- Tape
- Large cooler with ice water bath (class)
- Ice cold 95% ethanol (2 mls per student pair)
- 1 small test tube (1 per student pair)
- 1 wood applicator (1 per student pair)
- Large transfer pipettes

Procedures

1. Add kiwi/strawberry fruit into extraction solution in the zipper bag. Close bag and squeeze out air.
2. Crush the kiwi/strawberry thoroughly for 5 minutes. CAREFUL don't break the bag!
3. Place the bags into the hot water bath for about 10-15 minutes, making sure the fruit solution is fully beneath the water line. Occasionally shake the bag to evenly distribute the heat.
4. Move the "mashed" bags of kiwi/strawberry fruit solution into the ice bath for 1 minute. Remove and carefully mix the kiwi/strawberry fruit solution again. Repeat this procedure 5 times.
5. Tape the cheese cloth over the beakers. Filter the fruit mixture through the cheese cloth. Combine solutions from all student groups at this point. Let the solution drain 5 minutes.
6. Using the large transfer pipettes aliquot approximately 2 ml of the kiwi/strawberry fruit solution into a test tube, one for each pair of students.

7. Add approximately 2 ml of ice-cold ethanol to each tube by dropping it slowly down the side of the test tube, allowing it to rest on top of the kiwi/strawberry fruit mixture. Do not agitate the solution.
8. Let the solution sit for two minutes without disturbing it. The DNA will appear as transparent, slimy, white mucus which can be spooled up with the wood applicator stick.

WHAT IS THE PURPOSE OF EACH STEP?

1. Why do we “crush” the kiwi/strawberry fruit?
2. Why do we use shampoo?
3. What does the salt do?
4. Why do we need to cool the mixture?
5. What does the cold ethanol do?
6. Why can't we use room temperature ethanol?

DISCUSSION QUESTIONS AND ANSWERS

1. To extract DNA from cells, what must you isolate it from in the case of a plant such as strawberry?
2. What steps did we use to extract the DNA?
3. What is DNA used for when it is extracted?