INTEGRATED DNA TECHNOLOGIES

"At-home" DNA Extraction Protocol*

Dozens of protocols on the web provide instructions for extracting DNA from plants, fruit, wheat germ, etc. All of them result in students preparing large amounts of DNA, enough that everyone can see the DNA precipitate out of solution right before their eyes. The protocol presented here is one that we have used successfully many times with fruit to extract DNA.

Materials and Equipment
50 ml centrifuge tubes
Styrofoam or plastic cups (8oz.)
Zip-lock sandwich bags
Bleached coffee filters (white)
95% alcohol (ice cold)
whole strawberry

Lysis buffer: detergent (we use Pantene Pvo-V clarifying shampoo)
Salt (either iodized or non-iodized will work)
Distilled water

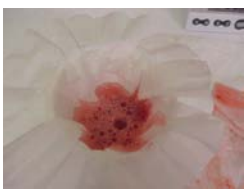
For each 100 ml of lysis buffer, use 90 ml of distilled water and 10 ml of detergent, add in ¼ teaspoon of salt. Stir the buffer until the salt is dissolved.

Procedure

1. Take off the leaves on the top of the fruit and place the fruit in a sandwich bag

2. Seal the sandwich bag and pulverize the fruit. We smash the fruit by hand and then roll a pen or marker back and forth over the bag to make the fruit as liquid as possible

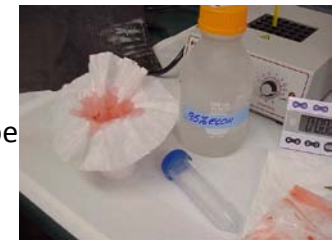
3. Add 10 ml of the lysis buffer to the bag and reseal
4. Continue to roll the fruit tissue in the lysis buffer for two minutes
5. Place a coffee filter in an 8 oz cup



6. Pour the contents of the sandwich bag into the filter and set aside

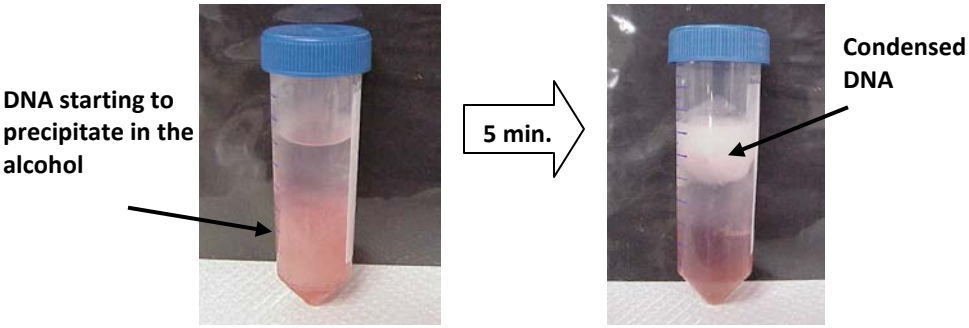
for 10 minutes

7. Discard the coffee filter and its contents



8. Pour 30 ml of ice cold 95% alcohol into a 50 ml centrifuge tube

9. Pour the contents of the 8 oz cup into the tube, cap the tube, wait for the DNA to start precipitating out in the alcohol (the process begins almost immediately and the DNA will continue to condense for the next few minutes)



Other, very good, protocols can be found at the web sites provided below. Many of these protocols are more involved than the one shown here but they do cover a wide range of possible samples including onion, wheatgerm, lima beans, kiwi, yeast. We have also used our protocol with tomatoes. We like the strawberry because it is very simple and it smells really good.

www.biotech.iastate.edu/publications/lab_protocols/DNA_Extraction_Kiwi.html

www.exploratorium.edu/ti/human_body/dna.html

http://biotech.biology.arizona.edu/labs/DNA_extraction_onion_studt.html

http://gslc.genetics.utah.edu/units/activities/wheatgerm/

www.accessexcellence.org/AE/AEC/CC/DNA_extractions.html

*This protocol was given to us by Julie Townsend, Parkview Middle School, Ankeny, Iowa.