# CALIFORNIA STATE SCIENCE FAIR
# 2002 PROJECT SUMMARY

**Name(s)**

**Ken L.M. Lozano**

**Project Number**

22552

**Project Title**

## DNA Extraction from White Onions using Laboratory Reagents vs. Household Materials

**Abstract**

**Objectives/Goals**

The objective was to determine if there is a difference between the characteristics of DNA extracted from white onions using laboratory reagents versus household materials.

**Methods/Materials**

Onion DNA was extracted in four trials from the white variety (control variable) using two types of extraction materials (experimental variable). The first involved the use of laboratory reagents (DNA NOW Cell Lysis Reagent and Precipitation Reagent) using the Biogentex Science Project Series SP 101 Kit "DNA Isolation Lab". The second involved the use of common household materials (detergent, meat tenderizer and isopropyl alcohol) following the procedure taken from the General Science Learning Center Website "How to Extract DNA from Anything Living". The general extraction method used is as follows: Collect onion cells through chopping and blending; Split open onion cells using DNA NOW Cell Lysis Reagent or detergent; Destroy enzymes using DNase Inhibitors; Separate DNA by heating between 55 to 65 C or meat tenderizer; and finally Precipitate DNA by DNA NOW Precipitation Reagent or 70% isopropyl rubbing alcohol. The onion DNA extracted was evaluated for general appearance. color, texture and amount obtained.

**Results**

The results of the four trials showed that the DNA extracted from white onions exhibited some differences in general appearance, texture and amount obtained. DNA extracted using laboratory reagents was in bubble-like stringy clumps at the middle and top of test tube. It was white with smooth, gelatinous texture. The one extracted from household materials was a thin, rough, clumped mucous-like white film between the alcohol and onion filtrate layers which eventually became clumpy. There was more onion DNA obtained using laboratory reagents as compared to household materials.

**Conclusions/Discussion**

In conclusion, there was a difference between the onion DNA extracted using laboratory reagents versus household materials in terms of general appearance, texture and amount obtained. From this experiment, future study involving electrophoresis for DNA profiling of other onion varieties can be done.

**Summary Statement**

This project deals with the comparison of DNA extracted from white onions using laboratory reagents versus common household materials.

**Help Received**

Dr. Reynaldo Villareal helped me select onions for this project; my dad helped me put together the wood base of the display board; and my mom/home school instructor guided me through all the steps of making a science project.

Preliminary