



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Megan K. Morikawa	Project Number S0416
Project Title Alternative Means of DNA Preservation: Dry Storage on Qualitative Filter Paper	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project was to explore and optimize a dry preservation technique for the storage of DNA. It was designed to correspond with the forensic analysis and to develop an easy and affordable way to send DNA samples via mail or store in the lab without electricity. It was hypothesized that DNA preservation on qualitative filter paper disks at room temperature would yield positive PCR results for the Cytochrome Oxidase Subunit I Gene(COI).</p> <p>Methods/Materials Experiment 1: Utilizing qualitative filter paper to store purified genomic chimp (Pan troglodytes) DNA and directly amplify with Polymerase Chain Reaction (PCR). Experiments 2 and 3: Extracting genomic DNA from mouse (Peromyscus leucopus) tissue through Protease and PBS cell lysis procedures. Experiment 4: Testing for positive recovery of DNA stored on sterilized qualitative filter paper medium (removing the PCR process). Experiment 5: Testing for positive PCR with disks by using various methods of washes for the sterile application of filter paper preservation (troubleshooting PCR process). Experiment 6: Storing DNA at various concentrations for a week, resuspending samples, then sending through PCR.</p> <p>Results Experiment 1 showed that the qualitative filter paper somehow inhibited the PCR process. Tests using blank autoclaved disks added to the normal PCR solution even inhibited the PCR process. Experiment 4 showed that it is possible to store DNA on 2mm disks of qualitative filter paper and then re-suspend DNA for use in electrophoresis or PCR. Experiment 5 showed that DNA concentration of 10ng/ul of Peromyscus leucopus was not sufficient for PCR reaction. PCR was working effectively and amplified the COI gene. Results from experiment 6 show that DNA can successfully be stored for a week, be resuspended, and amplified for PCR. Safe resuspension of two days yielded positive PCR results.</p> <p>Conclusions/Discussion My hypothesis is proved partially correct: DNA can be stored on the filter paper. When it came to the PCR process, electrophoresis results showed strong indicators that the physical presence of the qualitative filter paper inhibited the process of PCR. Three conclusions are met: DNA can be successfully stored on the qualitative filter paper medium, stored DNA must undergo a re-suspension in order to be useful, and if DNA will yield positive PCR results when aqueous, it will yield positive results when stored on filter paper.</p>	
Summary Statement This project was designed to explore and optimize a dry preservation technique for the storage of DNA.	
Help Received Mother helped construct board; Supervisor Dr. Vavra (biology teacher) gave general guidance on experiment design; Dr. Oliver Ryder of C.R.E.S. provided some materials and offered technical guidance	