CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Sandy E. Hawley

Project Number
S0406

Project Title
Size Matters: DNA Amplification

Abstract

Objectives/Goals
To optimize the PCR process and sequence my successfully amplified DNA.

Methods/Materials
PCR was performed with standard reagents and thermal cycling parameters. MgCl(2)concentration was varied, in addition to the annealing temperature, and agarose gel staining technique. DNA was sequenced and edited.

Results
In this experiment, the highest MgCl(2)concentration (8ul) and the higher annealing temperature (48 degrees C)produced the most amplified DNA. In addition, the ethidium bromide gel staining technique worked dramatically better than Ward's Quick View DNA stain. Cytochrome b gene fragment sequences were obtained for two individuals of the intertidal fish, Clinocottus analis.

Conclusions/Discussion
These results indicate that the highest MgCl(2) concentration improved the enzynmatic activity of the DNA polymerase. The increased annealing temperature allowed the primer to bind to the right complementary bases of the template DNA strand. The ethidium bromide DNA stain illuminated the amplified DNA better because the technique required ultra-violet light that made it easy to visualize the amplified DNA.

Summary Statement
I attempted to optimize the PCR process and sequence the successfully amplified DNA.

Help Received
Dr. Frank Cipriano, used lab equipment at San Francisco State University