



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

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Project Title
Does Vitis Extract (White Grape Seed Tannin) Have an Effect on Escherichia coli Plasmid Competency?

Abstract

Objectives/Goals
The goal of my experiment was to grow E. coli on nutrient agar treated with quantitative amounts of vitis extract. After allowing growth I harvested the colonies following the treatment. Then completed a p-blue plasmid protocol to count the competent colonies following incubation. My hypothesis was that the antioxidants in the vitis extract could be beneficial to our health and the plasmids would take up few cells in both the ampicillin plate and the p-blue plasmid protocol.

Methods/Materials
Materials: White Grape Seed Tannin (vitis extract), Presensitized LyphoCells, Super coiled pGAL (Blue Colony) DNA, Control Buffer, Ampicillin, X-Gal in solvent. Methods: 1. Make plates. 2. Streak for isolation 3. Treat plates with e. coli. 4. complete transformation 5. count transformations

Results
From all my observations and data I have come to the conclusion that vitis extract decreases the competency of E. coli. This shows that plasmids may have a harder time getting transformed when they are treated with vitis extract. When I tested the E. coli on the plates with ampicillin the bacteria on the controls, which contained the vitis extract but no plasmids, did not grow. This is because the ampicillin wiped them out. However the plates with the vitis extract, ampicillin and the plasmids transformed a couple of cells, fewer than the expected however. The pGal plates were similar to the ampicillin plates. All in all my results showed that the transformation rate was slowed down tremendously meaning that the vitis extract had a positive effect on the competency of the E. coli. On average my plates with ampicillin was 900 cells transformed per microgram of DNA. My plates with X-gal were 1020 cells transformed per microgram of DNA. My control was from 10,000 cells to 10,000,000 cells per microgram of DNA. So the numbers dropped tremendously.

Conclusions/Discussion
From analyzing the data, all the plates that were exposed to the vitis extract had a lot less colonies transformed than the expected amount for normally treated E. coli. This suggests that the vitis extract is having an affect on how the plasmids enter the cell wall of the bacteria. For humans this could be beneficial because most E. coli is found in the urinary tracts of our system and drinking wine with this extract in it shows that it allows less cells to be transformed in these tracts since the wine would usually pass through them.

Summary Statement
In my experiment I tested the effect of vitis extract on the competency of E. coli. The bacteria was transformed in the antibiotic, ampicillin, and I observed the effect vitis extract has on the transformation.

Help Received
Rebecca Avants guided me in safety procedures.