CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
S1735

Project Title
The Effect of Chemicals on Glial Cell Counts

Abstract

Objectives/Goals
My objective is to determine whether rat glial cell colony formation is decreased when caffeine or kava is added to the growth medium.

Methods/Materials
I incubated 60 wells of glial cells in control, kava, and caffeine medium, using two levels of chemicals, 50mg/L and 20mg/L. I initially thawed the cells and incubated them overnight before washing them and detaching them with trypsin. I created a cell sample with a dilution factor of 2 by adding 50uL of trypan blue to 50uL of my sample. This stained the dead cells blue and allowed me to count the cells in a hemocytometer. The viable cells/mL sample was then diluted with medium to 200 cells/mL for healthy cell growth. I then incubated 60 cell samples for seven days, and fixed, stained, and counted the cell colonies.

Results
The cells cultured in 50mg/L of caffeine had a 34% lower cell colony count when compared to the control samples. The cells cultured in 50mg/L of kava had a 41% lower cell colony count when compared to the control samples. Therefore, 50mg/L of the caffeine and kava affected cell proliferation counts greatly and were statistically significant.

The cells cultured in 20mg/L of caffeine had a 1% lower cell colony count compared to the control samples. The cells cultured in 20mg/L of kava had a 3% lower cell colony count compared to the control samples. Therefore, 20mg/L of the chemicals had no statistically significant effect.

Conclusions/Discussion
My conclusion is that 50mg/L of caffeine and kava added to growth medium significantly affects brain cell proliferation, yet 20mg/L of the chemicals have an insignificant impact. While coffee consumption is a well established part of American culture, Kava cafes are new in California. This study suggests that healthy ingestion levels of both chemicals, but especially kava, given the 41% decreased cell count from the control, should be further researched with possible consumption levels labeled and monitored.

Summary Statement
My project investigates whether adding caffeine or kava to rat glial cell cultures, reduces the number of cell colonies formed.

Help Received
My teacher helped me get the brain cells and prepare fix and stain solutions and my parents helped me find supplies.