



CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s) Sara A. Bryant	Project Number 22684
Project Title Methoprene Acid Affects the Growth of 3T3 Cells	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment is to observe the effects Methoprene Acid (MA), which acts as a hormone, and Thyroid hormone (T3) have on the growth of 3T3 cells.</p> <p>Methods/Materials Cell Culture - 3T3 cells were grown in culture medium with serum at 37°C. Cells were removed from the flask with trypsin and counted with a hemacytometer. The same number of cells were plated into each well of a 24-well tissue culture plate. After 24 hours, the test solutions were added to each well. Each solution was tested in triplicate wells for each experiment, except for the standard curve experiment in which cultures were tested in duplicate. Cultures were grown for another 48 hours in the presence of the test solutions.</p> <p>MTT Assay - The number of cells in each well was determined spectrophotometrically by measuring the amount of MTT that was metabolized. 50 µl of MTT (5 mg/ml in saline) was added to each culture well for 4 hours. Cells were then solubilized in 10% SDS overnight. Absorbance was measured at 550 nm after setting the zero reference at 690 nm.</p> <p>Results When the 3T3 cells were exposed to MA at low concentrations, the growth of the cells was stimulated. When exposed to high doses of MA, the MA had a lethal effect on the cells. The T3 inhibited the stimulation of growth by MA. T3 increased the growth of the 3T3 cells at high doses.</p> <p>Conclusions/Discussion The amount of MTT that is metabolized in each tissue culture well, is proportional to the number of cells in that well. DMSO is used to solubilize the test compounds (MA and TH). DMSO inhibits growth of cells in a dose-dependent fashion. MA stimulates growth of cells at low doses and inhibits growth at high doses. My hypothesis that the inhibition at high doses is a consequence of the induction of cell death. TH does not effect the growth of the 3T3 cells. TH neutralizes the high dose effect of MA. I hypothesize that TH functions to inhibit MA-induced cell death. "Cellular" balls were formed at high concentrations of Thyroid hormone (-4 and -5). Methoprene Acid inhibits the induction of the thyroid balls.</p>	
Summary Statement Testing the effects Methoprene Acid and Thyroid Hormone have on the growth of 3T3 cells.	
Help Received Used lab equipment at the University of California, Irvine under the supervision of Dr. David Gardiner	