CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Erika W. Cho

Project Number
J1406

Project Title
Retinoic Acid Effects on Early Amphibian Development

Abstract

Objectives/Goals
How does retinoic acid affect early stages of development? The objective of my experiment is to study how retinoic acid affects development in amphibians.

Methods/Materials
15 Petri dishes
DMSO
Ethanol
1 Digital Camera
1500 Xenopus Embryos
1% Retinoic Acid

1) Fertilize embryos
2) Make stock retinoic acid solution with DMSO
3) Make serial dilution of retinoic acid in water.
4) Apply retinoic acid into Petri dishes that contains 100 embryos at the gastrula stage each.
5) Leave for 30 minutes and then wash retinoic acid.
6) Leave in water for several days.
7) Repeat steps 1-6 with neural stage embryos.
8) Take pictures and record data.

Results
All the .01% solution embryos died. The higher the concentration of retinoic acid there were, the more deformations were found. The mutations included embryos with fused eyes, no eyes, no faces (heads) or only one eye.

Conclusions/Discussion
Retinoic acid both affected the embryos at the gastrula and neural stages equally. Tretinoin consists 1% of retinoic acid, but in the experiment, just small concentrations of the retinoic acid caused severe mutations in amphibian embryos. Although amphibians could be more sensitive to retinoic acid than human infants, Tretinoin should be handled carefully.

Summary Statement
This project is about how retinoic acid effects the early stages of amphibian development.

Help Received
Mother helped provide pharmacy books; Used lab equipment at University of California Irvine under the supervision of Dr. Ken Cho