



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Juliana C. McLaughlin	Project Number J1418
Project Title How Effective is Beta-Carotene in Fighting Cancer in Plants?	
Abstract Objectives/Goals To test the effectiveness of Beta-Carotene in fighting cancer in plants. Methods/Materials 6 pots, potting soil, sunflower seeds, tap water, 1 TBSP, measuring Cup, matches, inoculating needle, Agrobacterium Tumefaciens, Beta-Carotene, disinfectant, pencil, computer, 1 gallon water pitcher, metal tray. Procedure: Collect materials and fill 6 pots with potting soil labeling 2 pots each Group A, Group B and Group C. Divide sunflower seeds into 6 groups with 10 sunflower seeds in each group. Plant 1 group of sunflower seeds in each pot and water. When watering plants from Group A, add 2 drops of liquid Beta-Carotene. Repeat steps 3 & 4 each time watered. When plants reach 7"-10" tall and have 2 sets of leaves, inoculate. Wash hands, disinfect area with and sterilize inoculating needle. Remove cap from plant cancer and run the top of the tube over a flame. Insert inoculating needle into plant cancer tube. Insert inoculating needle inside the internodes- the stem between the leaves of the plant. Repeat for every plant in Groups A & B. Do not inoculate Group C. Wait 7-10 days. Observe and record data. Results The week before inoculating, Test Group I, they withered and died. This could have been from lack of watering, not enough sun, or possibly too much watering. When inoculating Groups A and B, there were few plants that were alive. Only 1 Group A plant survived, which did not grow tumors. In Group B, all the plants grew tumors. At the time they died, 5 tumors were counted. I charted these plants for 22 days. I decided to plant a second batch of plants, Test Group II. The Group A plants had a total of 4 tumors. The Group B plants had a total of 7 tumors. The Group B plants died and after 14 days 5 visible tumors were noted. I charted Test Group II for 14 days. No tumors ever grew on the Group C plants. Conclusions/Discussion With Test Group I, I discovered that plants which had been nourished with Beta-Carotene did not develop cancer, which was proven false by Test Group II. I realized after Test Group II that Beta-Carotene did not stop cancer from growing in plants. The Beta-Carotene helped to lessen the severity of cancer. Possibly with a higher or more frequent dosage of this supplement the plant could have fought the cancer off completely. From the results of my experiment, Beta-Carotene supplements could be used in human patients to prevent or reduce the affects of cancer. I would test this with higher dosages of the supplement.	
Summary Statement I tested the effectiveness of Beta-Carotene in fighting cancer in plants.	
Help Received Mother applied for the USDA permit and obtained the Beta-Carotene.	