



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ryan M. Chapman</b>	<b>Project Number</b> <b>J1409</b>
<b>Project Title</b> <b>Beta Carotene: Natural Cancer Fighter or Homeopathic Hoax?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My experiment tried to determine whether beta carotene helps prevent the growth of cancer in plants. <b>Methods/Materials</b> I germinated fifteen sunflower seeds: ten sunflower seeds in tap water, and five seeds in a solution of ½ liter water and two 25,000 IU tablets of beta carotene. All seeds germinated in five days. I planted them in 10 cm diameter pots of potting soil. All plants were watered three times each week. The beta carotene pots were watered with 10 ml. of the beta carotene solution. The other pots were watered with tap water. After three weeks all plants exceeded 15 cm. in height. Every plant, except 5 of the plain watered plants, were injected with 2 units of Agrobacterium tumefaciens, using a standard syringe. The plants were then watered twice a week, using the solutions described above. All plants were examined for changes and effects every two weeks. <b>Results</b> The measurements showed that the plants infected with the crown gall disease grew less than the control plants. No significant difference in the growth of crown gall (plant cancer) was observed between the infected plants watered with plain water and the plants watered with beta carotene. <b>Conclusions/Discussion</b> This experiment was expected to show that beta carotene helps reduce the spread of cancer. However, this was not the case. The presence of the Agrobacterium tumefaciens was seen in all plants infected, but there was no significant difference between the plants given beta carotene and those given plain water. In addition, the beta carotene also had serious effects on the plants. The beta carotene plants had slower growth and withered appearance compared to the plain water group prior to infection, and showed only a little better growth rate than the infected group after the cancer was introduced. While beta carotene may have positive effects in people, it does not seem to be a positive additive for plants.	
<b>Summary Statement</b> I tested whether adding beta carotene to plants helps prevent or slow the growth of plant cancer.	
<b>Help Received</b> My father obtained the plant cancer (Agrobacterium tumefaciens), helped inject the plants, and helped type my report.	