



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Nikole M. Ankrom	Project Number J1602
Project Title Does Beta Carotene Prevent Tumor Growth in Plants?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment is to determine if beta carotene is effective in preventing tumors (galls) in plants. Agrobacterium tumefaciens is a bacterium known to cause tumors in plants. I hypothesized that plants watered with water and added beta carotene would develop fewer tumors than plants watered with water, after being inoculated with A. tumefaciens.</p> <p>Methods/Materials Four groups of sunflowers (A, B, C, and D) with five plants in each group were planted using the same size pots and the same type of soil. Group A was watered with water and not inoculated with Agrobacterium tumefaciens (A. tumefaciens), group B was watered with a beta carotene solution and not inoculated with A. tumefaciens, group C was watered with water and inoculated with A. tumefaciens, and group D was watered with the beta carotene solution and inoculated with A. tumefaciens. I watered and measured the plants every second day and recorded their growth and tumor accumulation over a period of sixty-seven days.</p> <p>Results The plants watered with beta carotene solution and inoculated with A. tumefaciens accumulated a total of seven tumors while the plants watered with water and inoculated with A. tumefaciens accumulated a total of seventeen tumors. The plants not inoculated with A. tumefaciens developed no tumors. The plant groups watered with beta carotene grew taller in height than the plant groups watered with water.</p> <p>Conclusions/Discussion My conclusion is that beta carotene is effective in preventing tumor growth in plants. My results suggest that the antioxidant beta carotene made the plants less susceptible to tumor growth caused by A. tumefaciens.</p>	
Summary Statement I showed that beta carotene reduces the incidence of tumor growth (galls) by Agrobacterium tumefaciens in plants.	
Help Received Elizabeth Pflenging helped me with her expertise in plant pathology and plant inoculation. My dad purchased the A. tumefaciens, and my mom purchased the other supplies & materials.	