



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> Ariane C. Tom	<b>Project Number</b> <b>S1324</b>
<b>Project Title</b> <b>Plant Immunology: Do Bacteria on the Surface of Leaves Protect Them from Fungi?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To examine the bacteria and fungus growing on leaves and test whether or not bacteria can protect them. My hypothesis is that if there are bacteria that protect humans from infection through pores on their skin, then there must also be bacteria that play the same role on the surface of plant leaves. It is supported with the fact that species of bacteria have been found on both the openings of human skin and the surface of plant leaves. It is possible that these bacteria protect us from skin infections and must also protect plants.</p> <p><b>Methods/Materials</b> Two related experiments were conducted. In Experiment 1, I compared the bacterial and fungal growth in natural and sterilized conditions on both the outside and inside of leaves. It was divided into 2 Cultures and 2 groups: A and B. Group A leaves were left in a natural condition while group B leaves were sterilized and rinsed with distilled water. I assumed that this sterilization process decreased the surface bacteria and fungus. Culture 1 was of the outside and Culture 2 was of the inside of the leaves. In Experiment 2, I isolated the microbes separately in Petri dishes and determined if the various bacteria found on leaves in Experiment 1 had an effect on the growth of the fungi found.</p> <p>Petri dishes, sterile cotton swabs, Chicken bouillon cubes, and Knox gelatin, 200 leaves</p> <p><b>Results</b> All leaves showed much higher bacteria to fungi ratios on the inside of the leaves than outside. The fungal growth rate was slowed dramatically in Culture 2. One particular species of bacteria (B3) is interesting because of its highly exterminating effect on fungus and other bacteria. This bacteria destroyed/liquefied the agar and may have excreted a chemical to do so. I assume that this chemical is used in the plant to protect it because it retarded fungal growth.</p> <p><b>Conclusions/Discussion</b> The results showed that bacteria on the inside of leaves retarded the growth of fungus on the inside of the leaf. The results for only one plant were consistent with my hypothesis that bacteria on the outside of the leaf protected the inside of the leaf because after bleaching, there was a larger population of fungus inside than outside.</p>	
<b>Summary Statement</b> My project shows that there are bacteria either outside or inside the leaves that protect the inside layers from fungi.	
<b>Help Received</b> My father helped me place the tags on tested leaves.	