



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

<b>Name(s)</b> <b>Miriam C. Glicksberg</b>	<b>Project Number</b> <b>J1411</b>
<b>Project Title</b> <b>Does Sunscreen Prevent UV-Caused Mutations?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> I wanted to see if I could use the bacterium E. coli instead of animals to test whether sunscreens worked. I hypothesized that the higher the SPF rating, the more protective the sunscreen would be at blocking mutations caused by UV rays. <b>Methods/Materials</b> I spread 500-1000 single cells of the bacterium E. coli onto plates, and exposed them to UV light at a tanning salon to cause mutations. Onto the plate lids I applied different SPF sunscreens all of the same brand, aluminum foil or no addition. By counting the number of colonies that grew I was able to determine whether the treatments helped to block mutations. <b>Results</b> The average number of colonies that grew from UV-treated bacteria was higher if the lid had a treatment to block out the UV. Except for SPF45, sunscreen with a higher SPF rating (SPF30) was more protective than lower SPFs (8 and 15) in blocking UV-induced mutations in bacteria. <b>Conclusions/Discussion</b> I conclude that my hypothesis was mostly correct. Except for the SPF45 lotion, the higher SPF rating was more protective at blocking UV-caused mutations. This is important because sunscreen is necessary to prevent skin cancer in light-skinned people. My method allows bacteria to be used instead of humans or other vertebrates to show that sunscreens do what they advertise.	
<b>Summary Statement</b> I demonstrated that bacteria could be used as a model system to show that sunscreens do protect cells from mutations caused by ultraviolet rays.	
<b>Help Received</b> Mother taught me microbiology techniques and helped with typing. Midnight Sun Tanning Salon donated time for UV exposures. Science teacher loaned me homemade incubator.	