



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Miriam C. Glicksberg	Project Number 22566
Project Title Does Sunscreen Prevent UV-Caused Mutations?	
Abstract Objectives/Goals 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. Methods/Materials 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. On 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. Results 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. Conclusions/Discussion 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.	
Summary Statement I demonstrated that bacteria could be used as a model system to show that sunscreens do protect cells from mutations caused by ultraviolet rays.	
Help Received Mother taught me microbiology techniques and helped with typing. Midnight Sun Tanning Salon donated time for UV exposures. Science teacher loaned me homemade incubator.	