CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J1412

Project Title
Can Bacteria Get a Sunburn?

Abstract

Objectives/Goals
I wanted to determine whether bacteria can be used as a test for protection against ultraviolet ray damage and skin cancer. I used ultraviolet light (UV) to affect bacterial growth, and tested whether sunscreen protected against damaging effects of UV light. I hypothesized that UV light will kill the bacteria. Sunscreen should block the UV light and allow the bacteria to grow. My reasoning is that bacteria are like skin cells, which if they are exposed to sunlight (which contains UV light), will die or get severely damaged. The sunscreen will absorb the UV light and the bacteria will not be damaged.

Methods/Materials
Make agar petri dishes (about 20). Innoculate the dishes with a cloned bacterial culture. Cover half of a Petri dish with glass and the other half with Saran wrap, with and without sunscreen. Illuminate with UV light for 30 minutes. After 3 days growth, scrape 4 square centimeters of the bacterial film and measure protein with Bradford Reagent. Take micrographs of the bacteria at 1000X magnification

Results
When the bacteria were illuminated with UV light they all died. The bacteria were protected and did not die when the sunscreen was applied. My graphs show the amount of protein in the bacteria with and without illumination by UV light and confirm that the sunscreen protects the bacteria.

Conclusions/Discussion
I proved that my hypothesis was correct. UV light kills the bacteria but sunscreen blocks the UV light and allows the bacteria to grow. I learned that bacteria are somewhat like skin cells and that UV light damages the DNA in them causing them to die. We get a sunburn and I found that bacteria get a sunburn too. My project is relevant to skin cancer because in order to find cures for skin cancer, we need to know whether a particular drug works. We might be able to use bacteria for testing because I have discovered that bacteria react the same to UV light as skin cells do.

Summary Statement
I tested to see what effect ultraviolet rays have on bacteria and whether sunscreen can protect them.

Help Received
Mother and Father helped type. Father helped conduct experiment. I used equipment at Dr. David Deamer's lab, UC Santa Cruz.