



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

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Project Title
Retarding the Growth of Escherichia coli with Varying Light Wavelengths

Abstract

Objectives/Goals
Not all E. coli are bad, and UV light is harmful to humans. If there was a way to minimize the growth rate of the bacteria so as to harness what is needed then scientist could grow only what is needed for various reasons without the constant problem of over growth. Also, if extermination was needed, then UV light would not be necessary. People could turn on a non-harmful light to kill the bacteria without worrying about being exposed to harmful rays.

Methods/Materials
After gaining all materials needed, create E. coli dilutions of 1:1000 and 1:10000. Cover the nutrient agar plates with four drops of the polluted .09% saline solution. Place these coated plates upside down in their respective boxes for approximately 48 hours. After the time frame, remove the plates and count the number of colonies per quarter of each plate.
1. 3 lamps; 2.1 violet filter; 3. 1 red filter; 4. 1 yellow filter; 5. 15 agar plates with agar (3 per light, 3 control, and 3 tests); 6. 1 small vial of E. Coli; 7. 1 300 mL flask of 0.9% Saline Solution; 8. 1 incubator set to 37 degrees C; 9. 3 boxes with 1 window each; 10. Several pipettes; 11. Several Q-tips; 12. 5 vials with lids; 13.4 thermometers.

Results
Control 1 105 entire plate Naked eye
Control 2 462 entire plate Naked eye
Control 3 388 entire plate Naked eye
Red 1 3 in center 40 magnification
Red 2 19 in center 40 mag
Red 3 19 center 40 mag
Violet 1 1 center 40 mag
Violet 2 31 center 40 mag
Violet 3 35 center 40 mag
Yellow 1 2 center 40 mag
Yellow 2 31 center 40 mag
Yellow 3 35 center 40 mag

Research continuing

Conclusions/Discussion

Summary Statement
Our study investigated the impact of different wavelengths of light on bacterial growth (E.coli) with some surprising results.

Help Received
Our Advisor, Martha Kimber, provided useful microbiology protocol information from UCD library.