



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Amruth Chilukuri</b>   | <b>Project Number</b><br><b>J2102</b> |
| <b>Project Title</b><br><b>The Effects of Ultraviolet Radiation on Yeast Colony Growth</b>  |                                       |
| <b>Abstract</b><br><b>Objectives/Goals</b><br>The objective of this project is to determine which type of Ultraviolet Ray (A or B) would have the most lethal impact on yeast colony growth.<br><b>Methods/Materials</b><br>UV-sensitive yeast culture (mutant in several DNA repair pathways), sterile dilution tubes, sterile toothpicks, Yeast-extract dextrose medium, Petri dishes, sterile distilled water, and pipettes. Measured percentage of yeast colony death after exposure to UVA and UVB Rays.<br><b>Results</b><br>Petri dishes filled with YED and yeast extract from a single colony were placed in the sunlight during different times of the day. Yeast (at various concentrations from a serial dilution) was placed in the sun from 12pm-4pm for UVA exposure and then taken inside and wrapped in aluminum foil. Other petri dishes of yeast at various concentrations were placed outside from 4pm-8pm for UVB exposure and then taken inside. Percentage of yeast death was calculated and it was determined that UVA had a more significant impact on yeast colony growth than UVB because more yeast colonies grew on UVB exposed petri dishes compared to UVA exposed dishes.<br><b>Conclusions/Discussion</b><br>After conducting numerous trials between UVA exposed dishes and UVB exposed dishes, they reveal UVA Rays had a more lethal effect on the yeast colony growth compared to UVB Rays. It can be concluded that UVA will continually have a harmful impact on yeast colony growth. This is significant because yeast colonies in this experiment mimic human skin cells or the epidermis. The yeast used are mutated in several DNA repair pathways thus DNA cannot repair itself. When exposed to UV rays, the yeast cannot grow and we can assume that UV rays also have a negative effect on human skin cells. Repetitive damage to skin cells can result in melanomas and carcinomas for humans. Thus this experiment substantiates the claim that UV rays can cause significant damage to humans by examining a yeast model to study DNA damage. |                                       |
| <b>Summary Statement</b><br>By measuring the percentage of yeast colonies after exposure to different Ultraviolet Rays, I discovered that UVA had a more overall lethal impact on yeast colony growth.  |                                       |
| <b>Help Received</b><br>I designed and conducted the experiment by myself.  |                                       |