



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

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| Name(s) Jessica T. Brennan | Project Number J2205 |
| Project Title UV Protective vs. Ordinary Fabrics: Effectiveness Before and After Washing | |
| <p style="text-align: center;">Abstract</p> <p>Objectives/Goals I enjoy hiking and the outdoors. At a store I noticed clothing that carried a UV protective label. I thought about a friend who had been sunburned under an ordinary t-shirt. The damaging effects of UV light are well known. I was curious to discover if UV protective fabric would truly provide additional protection against UV radiation when compared to ordinary fabric. I also wondered whether the fabrics, when washed, would maintain their effectiveness in blocking ultraviolet radiation. I hypothesized that UV protective fabric would protect bacteria from UV light better than ordinary fabric, and that washing would have a negative effect on a fabric's ability to block UV light.</p> <p>Methods/Materials This experiment consisted of two parts, both of which examined the effects of ultraviolet light on <i>Serratia marcescens</i> bacteria. The first part of the experiment examined the effectiveness of UV protective versus ordinary fabric by testing the bacteria's viability after exposure to UVA or UVC light for varying lengths of time when shielded by a fabric sample. The second part of this experiment was carried out in the same manner, but used only a UVC lamp and examined the effects of washing on the two types of fabrics.</p> <p>Results Since the UV protective fabric is intended to block UVA and UVB light, a UVA light was tested in this experiment. Unfortunately, the UVA light didn't seem to have any consistent effect on bacterial growth even after prolonged exposures. Tests with the UVA light could not accurately measure information about the fabrics' protectiveness. However, the UVC tests in both the first and second experiment showed that the UV protective fabric did block the UVC light significantly better than ordinary fabric. Surprisingly, washing appeared to actually improve the protective effects of the UV blocking fabric. The results of washing were inconclusive for the ordinary fabric.</p> <p>Conclusions/Discussion UV protective fabric appeared to block UV rays better than ordinary fabric. Its effectiveness in blocking UV rays seemed to improve with washing even after the fabric was washed up to seventeen times. From the results of this experiment, it appears that wearing UV protective fabric may be of benefit in reducing exposure to UV light.</p> | |
| Summary Statement The goal of this project was to discover whether UV protective fabric would block UVC rays more effectively than ordinary fabric and whether the protective effect might diminish with the washing of the garment. | |
| Help Received Mother helped with pipetting bacteria. Advisor provided lab space and UVA bulb and fixture. Mother and advisor supervised use of UV lights. | |