CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
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Project Number
J1608

Project Title
Effects of Ultraviolet Light on Bacteria Mortality: Bacillus subtilis vs. Micrococcus luteus

Abstract

Objectives/Goals
In my experiment, I wanted to test the effects of UVC light on bacteria. I decided to test two non pathogenic strains, known as Bacillus subtilis, and Micrococcus luteus, to see how sensitive each strain of bacteria was to the UVC lamp (254 nanometers light.) Based on my research, I hypothesized that almost all of the Bacillus subtilis colonies would be killed, in 30 seconds, as this bacteria species is quite sensitive to UV light. I believed most of the Micrococcus luteus colonies would be eliminated at an exposure time of 60 seconds.

Methods/Materials
In my experimental process, I first performed a serial dilution. This step was taken to confirm the tube in which the bacteria grew an amount, that was easily quantifiable. Once the correct dilution for each strain was determined, I pipetted an equal amount of bacteria from each strain into 10 plates for a total of 20 plates. I covered half of each plate and exposed each set of 5 plates under a UV light for different periods of time.

Results
According to the results, Bacillus subtilis reached a 100% mortality rate after being exposed to the UV light for one minute. The Micrococcus luteus, however, achieved 100% mortality only after seven minutes of exposure.

Conclusions/Discussion
It appears sensitivity to UVC light may vary greatly between different species of bacteria. Bacillus subtilis and Micrococcus luteus are both Gram positive bacteria yet the ability to tolerate UVC exposure was strikingly diverse. This suggests other bacteria, including pathogens, may require lengthy exposures to UVC light to achieve 100% mortality.

Summary Statement
In my project, I tested the effects of ultraviolet light on bacteria mortality, and compared the sensitivities of each strain, given the assigned time exposure.

Help Received
Mrs. Roxanne Hunker, Mrs. Amritha Menon, Thermo Fisher Scientific, and Carolina Biological Supply Company.