Automated UVC Sanitizing of Money

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The purpose of this experiment was to create a cost-effective, portable, automated UVC sterilizing system that kills bacteria on money through the sanitizing properties of UVC light. Multiple dollar bills were swabbed and placed within a UVC chamber. Bills were first placed in a UVC chamber for 30-second increments starting from zero- to three-minutes (ex. 30 seconds, 1 minute, 1 minute 30 seconds, etc.). After a 30-second interval had passed, a sterile swab was dampened with sterile water and used to swab the remaining bacteria off the bill. Bacteria swabbed was immediately placed on a petri-dish filled with nutrient agar, sealed shut with tape, and incubated within an incubation chamber set to 37C for 24hrs. To test for effectiveness we hypothesized that an increase in the amount of UVC light exposure will result in a decrease in the number of bacteria cultivated from a dollar bill while our null hypothesis was that UVC light does not significantly affect the growth rate of bacteria cultivated from a dollar bill. A t-test was conducted between the Control and 3 mins of UVC radiation and it generated a t-Critical one-tail of 2.919 and a t-stat of 7.222. Because our t-stat was higher than our Critical one-tail value we concluded that there was a statistically significant difference between the two groups and determined that bacteria on paper currency can be killed through the usage of a portable, automated UVC sterilization system.

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