The Impact of Ultraviolet Radiation on DNA Repair-Deficient Yeast

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The sun provides heat and light to humans and other organisms, but while it is regulating our planet, it is also causing damage to our DNA. The purpose of our experiment is to observe how UV radiation can affect DNA, specifically repair deficient DNA. This allowed us to measure exactly how certain amounts of exposure to sunlight affected our DNA before it got a chance to repair itself. Since it lacked base-excision repair enzyme uracil-DNA glycosylase that allowed DNA to repair itself, we were able to see the impact that various amounts of exposure to sunlight had on it. To do this, we used a strand Baker's yeast, Saccharomyces cerevisiae, that was genetically engineered to be DNA-repair deficient. Our first step was to put the yeast into five tubes, and then allow them to grow for two days in a dark room. Then we made serial dilutions, to reduce the concentration of the Baker’s yeast. The final step was to expose the serial dilutions to sunlight. Originally we were suppose to have more samples exposed, but because of contamination we had fewer samples. We covered two agar plates with aluminum foil, which kept it from getting exposed. Then we covered the other two corresponding dilutions with plastic wrap. We exposed it to about 3 to 4 minutes of sunlight in the fall. Contrary to our hypothesis, the sunlight caused a more than 50% decrease compared to the control.

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