



CALIFORNIA STATE SCIENCE FAIR 2016 PROJECT SUMMARY

Name(s) Allison M. Kifer	Project Number 36303
Project Title Using Yeast to Model Expired Sunscreen's Effectiveness	
Abstract Objectives/Goals Using DNA repair deficient yeast to model expired sunscreen's effectiveness to absorb ultraviolet light. Hypothesize that expired sunscreen has a significant decrease in efficiency. Methods/Materials Used DNA repair deficient yeast (from Carolina Biological), plastic wrap, aluminum foil, two brands of sunscreen (with expired and non-expired samples), a UV lab bench, and an incubator. Grew UV sensitive yeast colonies on a YED medium. Replaced the petri lid with plastic wrap and covered one half with aluminum for each plate. For the control plate, added no sunscreen. For the expired plates, added expired sunscreen on the exposed side of the plastic wrap. For the non-expired plates, added new sunscreen of the same brand to the exposed side of the plastic wrap. Set all plates in a UV lab bench for 15 minutes. After exposure, replaced wrap with petri dish lids, placed in incubator, and analyzed observations. Results The experiment's results reflected that sunscreen does lose its effectiveness past expiration. After exposure, the areas of exposed yeast lawns were compared to the areas of the non-exposed yeast then averaged for the three trials. Average yeast growth after ultraviolet exposure for the expired sunscreens (EE1 and EE2) were significantly less (18.83% and 26.65% respectively) than the growth of the yeast colonies (96.98% and 87.30% respectively) with the non-expired sunscreens (EN1 and EN2). The results support the hypothesis that sunscreen's efficiency decreases over time. Conclusions/Discussion The expired sunscreen plates (EE1 and EE2) had significantly less average area growth of yeast than the non-expired sunscreens (EN1 and EN2) after three trials. This demonstrates that expired sunscreen loses significant effectiveness to absorb UV light.	
Summary Statement I used yeast colonies to model how sunscreen's efficiency to absorb ultraviolet light decreases past expiration, and found that sunscreen does lose its effectiveness.	
Help Received I learned how to plate cultures and use the UV bench safely from my biotechnology teacher. I used the specific yeast sample from the Carolina Biological website.	