CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J1846

Project Title
Effectiveness of Moisturizers and Sunblocks in Filtering UVA Rays

Abstract

Objectives/Goals
It is widely agreed that sunblocks do a relatively effective job of blocking UVB rays which are ultraviolet rays that cause sunburn as well as skin damage, and potentially, skin cancer. UVA rays also contribute to the development of skin cancer and play a larger role than UVB rays in the creation of wrinkles and premature aging. The FDA has no accepted test for measuring UVA protection. The SPF (sun protection factor) does not correlate to UVA ray exposure. As a result, there may be a wide variance in the effectiveness of sunblocks and moisturizers in protection against UVA rays. The goal of my experiment was to determine the range of effectiveness in filtering UVA rays for various moisturizers and sunblocks. My hypothesis was that there would be significant differences in the range of UVA protection provided by moisturizers and sunblocks with the same SPF ratings.

Methods/Materials
I constructed a device from a box for the purpose of viewing results. I used UVA detecting beads whose "colors" become visible to the human eye when exposed to UVA light, especially at about 365 nm. I coated one side of a sheet of acrylic plastic evenly with 15ml of the moisturizer/sunblock substance that was being tested. I placed the acrylic with sunblock on the top of the box and took it outside. I started the minute timer, and then recorded results. I preformed six repetitions of the entire experiment for all test moisturizers/ sunblock. I assigned ranking numbers 1-10 to the bead colors, since I noted the beads required different amounts of UVA exposure to "change" color.

Results
The most protective moisturizer I tested, "Anthelios", was even more effective in filtering UVA rays than the SPF 15 sunblock. Olay SPF 15 moisturizer was not as effective, but appeared to also be a good UVA filter. L'Oreal and Purpose however, were far less protective than the other products.

Conclusions/Discussion
The amount of UVA protection offered by products with the same SPF rating varied widely. The public assumes since the SPF ratings are the same, the total sun protection offered will be the same in these products. Unfortunately, the amount of protection provided is not equal.

Summary Statement
This Project investigated whether products with the same SPF (UVB) rating were also equally UVA protective and found UVA protection varied widely.

Help Received
Thanks to my parents who helped me purchase supplies and my science teacher who helped edit my report.